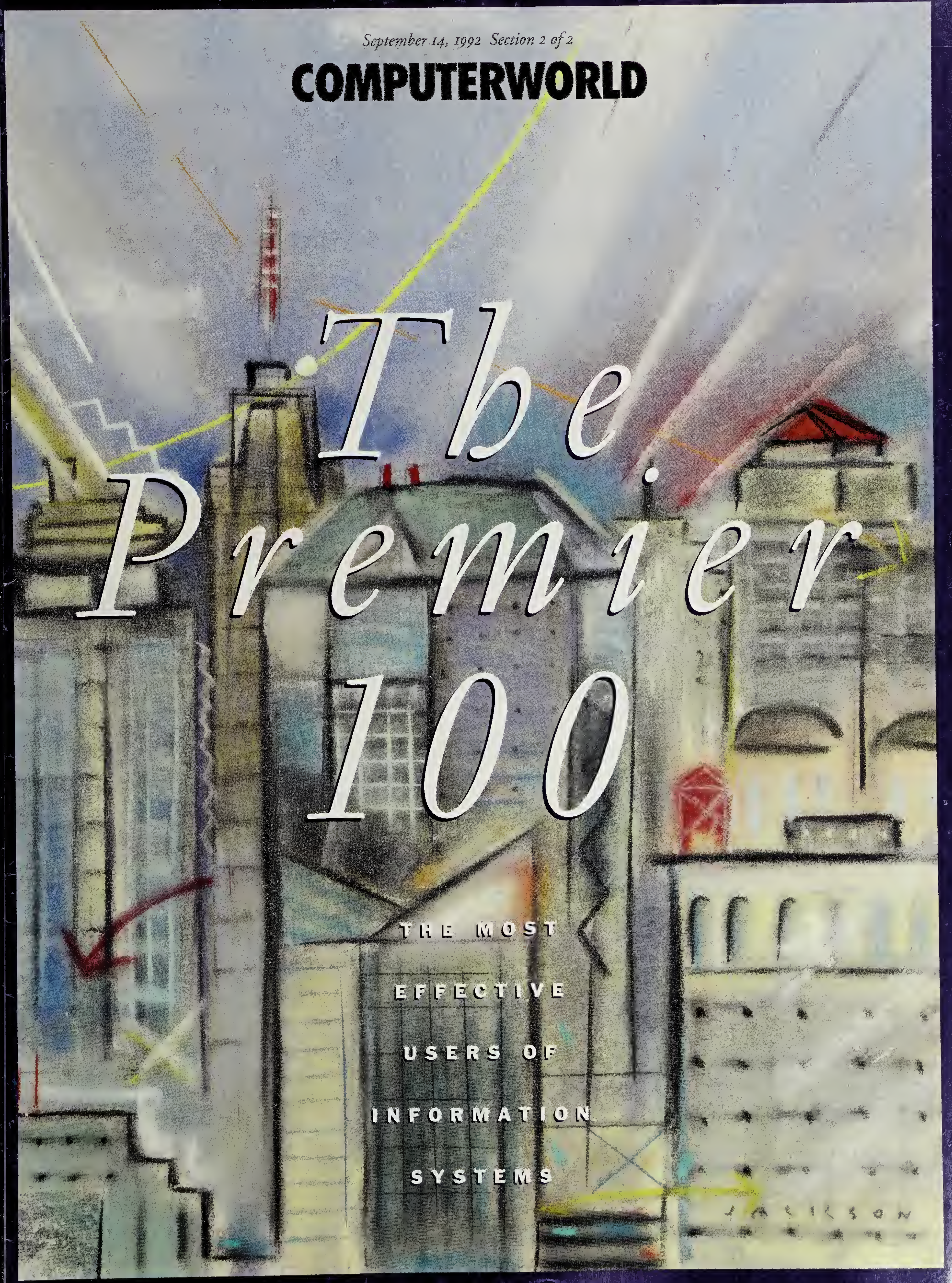
September 14, 1992 Section 2 of 2
COMPUTERWORLD



The Premier 100

THE MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

This is the company you
see in your rear-view mirror,
lights flashing,
passing the pack,
shouting
client-server computing.

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCstation is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

May we introduce ourselves?

Ten years ago, we started the engine of a new computer company with a radical idea. To bring to the world the first client-server computing platform that was truly open. Nothing proprietary. Nothing hidden from view.

Nearly four billion dollars in annual revenue later, it can safely be said our aim was true.

Not only is Sun™ outperforming the biggest names in computing, we've grown at a rate five times faster than the industry as a whole.

Today, in 125 countries, more than 500,000 people use Sun computers, making us the world's largest maker of UNIX™ computers. And the world's most popular distributed computing solution ever.

We are the only UNIX-based computer company that can offer compatible, scalable chip technology for notebook computers to supercomputers.

As well as the only computer company with 16,000 service and support experts in UNIX, in 65 centers around the world.

And that's just the view from *our* rear-view mirror. To find out how you can lower your computing costs while raising productivity, call 1-800-426-5321, ext. 500. And ask to see where client-server computing is headed.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Computerworld
Premier 100

EDITORS
Michael L. Sullivan-Trainor
Joanne Kelleher

MANAGING EDITOR
Joyce Chutchian

DESIGNER
Tom Monahan

ASSISTANT MANAGING EDITOR
Alice Lesch Kelly

WRITERS
Amy Bernstein
Barbara Francett
Cheryl Goldberg
Kathleen Gow
Lucie Juneau
Julia King
Alice LaPlante
Emily Leinfuss
Daniel Lyons
Mark Mehler

CHIEF COPY EDITOR
Catherine Gagnon

COPY EDITORS
Kimberlee A. Smith
Steven J. Condon
Anne McCrory
Stephen P. Klett Jr.
Christina Maguire

FREELANCE EDITOR
Peter Tietjen

RESEARCHER
Lisa Davidson

PRODUCTION MANAGER
Christopher P. Cuoco

ADVERTISING COORDINATOR
Peggy Hennessey

■

EDITOR IN CHIEF
Bill Laberis

■

Copyright 1992 by CW Publishing, Inc. All rights reserved.

Computerworld can be purchased on 35mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich., 48106. Photocopy rights: Permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing, Inc. for libraries and other users registered with the Copyright Clearance Center provided that the base fee of $3.00 per copy of the article, plus 50 cents per page, is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, Mass., 01970. Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing, Inc., 375 Cochituate Road, Box 9171, Framingham, Mass., 01701-9171. Subscriptions call toll free (800) 669-1002. Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates : $2.00 a copy; U.S. – $48 a year; Canada, Central & So. America – $110 a year; Europe – $165 a year; all other countries – $245 a year (airmail service).

■

COVER ILLUSTRATION
Jeff Jackson

COVER DESIGN
Concrete Design Communications

ABOUT THIS ISSUE

4

RISING ABOVE THE CHALLENGES

In a tough year, IS executives balance strategic necessities with cost constraints and learn how to take measured risks.

WINNERS BY INDUSTRY

10

AEROSPACE

Do it smart and do it once: Beleaguered industry emphasizes streamlining and waste reduction.

By Kathleen Gow

13

CONSUMER PRODUCTS AND SERVICES

Catering to the customer: Well-stocked store shelves keep retailers happy.

By Barbara Francett

18

FINANCIAL SERVICES

Growth is relative: Budgets are bigger, but so are expectations.

By Amy Bernstein

DRESSER INDUSTRIES' *Henry Paulsen, page 21*

21

INDUSTRIAL AND AUTOMOTIVE PRODUCTS

New spirit of conservatism: This is not the time for experimentation.

By Mark Mehler

26

MANUFACTURING

Breaking the mold: Companies concentrate on strengthening the customer link.

By Emily Leinfuss

PHOTOGRAPHY: HENRY PAULSEN BY DAN BRYANT; ILLUSTRATION BY JEFF JACKSON

Editors' Note

No more easy wins

Excellence comes easier in the midst of prosperity. So IS executives whose companies are among the *Computerworld Premier 100* industry groups this year deserve a special round of applause. They have not only adjusted to the realities of a sustained recession in terms of their own operations but have helped their companies to stay on course and in the race.

The challenges that confront IS executives these days are unique. They are being asked to help produce radical and rapid change in a setting of financial austerity. In many cases, that means devising systems that will cut costs and help to distinguish their company in the marketplace. The performance bar has been raised several notches, and there are no more easy wins.

Premier 100 IS executives have a number of things in common. One is a feel for corporate priorities; another is a sense of when technological risk-taking is appropriate. Still another is the admiration of their industry peers. We feel strongly that no one is better equipped to judge a company's IS effectiveness than another IS executive in the same industry. For that reason, we have doubled the weight given to peer ratings in this year's selection of the *Premier 100.*

Our congratulations to the winning companies – the most effective corporate users of information systems in the U.S. – and to the executives who guided their use of technology. This designation has never been an easy one to earn, but this year it really took something extra. ■

PHILLIPS PETROLEUM'S *Jim Gottardi, page 29*

29

PETROLEUM AND CHEMICALS

Down to fighting weight: Less is more as users battle recession.

By Cheryl Goldberg

34

PHARMACEUTICALS AND FOOD

Spending for the future: Companies take advantage of a buyer's market.

By Daniel Lyons

37

RETAILING AND WHOLESALING

Luring consumers with conspicuous efficiency: Limited but well-targeted spending pays off.

By Lucie Juneau

42

TRANSPORTATION

The name of the game is revenue generation: Information can be a money maker.

By Julia King

47

UTILITIES

Betting the farm on technology: Stay ahead or be vulnerable.

By Amy Bernstein

MCI'S *Jim Zucco, page 47*

INSIDE THE 100

53

SELECTING THE TOP USERS

How we measure the effective use of IS in the *Computerworld Premier 100.*

54

THE PREMIER 100 TABLES

Detailed data on all 100 companies.

ACKNOWLEDGMENTS

Computerworld **would like to acknowledge the following organizations for their assistance in creating this year's *Premier 100*: Andersen Consulting, Arthur D. Little, Inc., A. T. Kearney, CSC Index, Inc., Cleveland Consulting Associates, CW Database Division, Deloitte & Touche, Ernst & Young, First Market Research, International Data Corp., McKinsey & Co., Technology Investment Strategies Corp. and SNL Securities. We would also like to thank all the IS executives and their staffs for their time and patience in responding to our many inquiries.**

LAST WORD

63

DO YOU HAVE WHAT IT TAKES?

Key factors in the successful use of information systems.

By DuWayne Peterson

PHOTOGRAPHY: JIM GOTTARDI BY ALAN LEVENSON; JIM ZUCCO BY KATHERINE LAMBERT

Rising to the challenge

Top IS executives use a variety of strategies to overcome the hurdles of economic pressure and rapid change

The year: 1992. The place: the boardroom of a large Fortune 500 company. A chief information officer stands before the executive committee preparing to argue for several million dollars of extra leeway in the IS budget for the coming year. The CIO faced this same group last year and had to walk away without an increase. As a result, he's spent the whole year shuffling resources and trying to figure out how to get all those new systems built without dropping service levels or letting older systems deteriorate. This time, the audience isn't any easier.

Each committee member is aware of the slow economy and extreme pressure from domestic and foreign competitors on the company's bottom line. The chief executive officer in particular is concerned about an upcoming stockholder's meeting where he will have to explain last quarter's disappointing results.

Reviewing his options, the CIO realizes his staff's excitement over performance ratings of the new technology will not impress the group. Neither will they be interested in a discussion of the elegant software interfaces that his programmers have created to link diverse applications and make the front ends easier to use. He'd better cut to the chase.

Pulling himself to his full height, the CIO launches into a presentation stressing the long-term resource savings and process improvements that the switch to local-area network-based client/server systems will make possible. Sure, it will cost money up front, but down the road, an open systems approach will place more power in the hands of users.

The CIO restrains an urge to wipe his brow as the corners of the CEO's mouth turn up in an almost imperceptible smile. "He's buying it," the CIO thinks, knowing the executives would rather hear about downsizing than a requisition for another $10 million mainframe. "Now all I have

THE WINNERS

	AEROSPACE	CONSUMER PRODUCTS AND SERVICES	FINANCIAL SERVICES	INDUSTRIAL AND AUTOMOTIVE PRODUCTS	MANUFACTURING
1.	The Boeing Co.	Reader's Digest Association, Inc.	J. P. Morgan & Co.	Dresser Industries, Inc.	Kimberly-Clark Corp.
2.	Grumman Corp.	Procter & Gamble Co.	Primerica Corp.	Black & Decker Corp.	Corning, Inc.
3.	McDonnell Douglas Corp.	Levi Strauss Associates, Inc.	Banc One Corp.	Caterpillar, Inc.	3M Co.
4.	Martin Marietta Corp.	Gillette Co.	CoreStates Financial Corp.	Harley-Davidson, Inc.	Inland Steel Industries, Inc.
5.	Lockheed Corp.	American Brands, Inc.	KeyCorp	Eaton Corp.	Cone Mills Corp.
6.	Raytheon Co.	The Dun & Bradstreet Corp.	BankAmerica Corp.	Ford Motor Co.	Amoskeag Co.
7.	Rockwell International Corp.	McGraw-Hill, Inc.	Barnett Banks, Inc.	Deere & Co.	Eastman Kodak Co.
8.	Textron, Inc.	Helene Curtis Industries, Inc.	Unum Life Insurance Co.	Paccar, Inc.	Sonoco Products Co.
9.	Northrop Corp.	Humana, Inc.	Bankers Trust New York Corp.	Trinity Industries, Inc.	Polaroid Corp.
10.	General Dynamics Corp.	Johnson Controls, Inc.	Massachusetts Mutual Life Insurance Co.	Ingersoll-Rand Co.	Bethlehem Steel Corp.

to do is make it work.” Quietly, he permits himself the gesture of tapping his knuckles on the table.

■

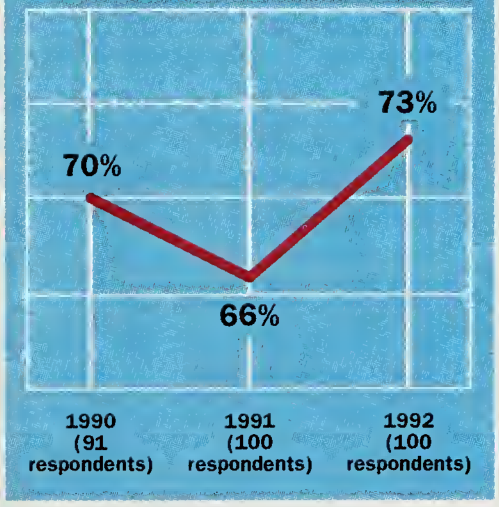
This CIO is not any of the executives listed in the 1992 *Premier 100*. But in many ways he represents them all. Whatever their industry, IS chiefs at the leading companies are feeling more performance pressure than ever before. They are being asked to come up with new kinds of systems and system configurations that will give their companies that all-important edge in the market, often with the stipulation that expense be held to a minimum.

Money is on everyone’s mind this year. It isn’t always a matter of actual budget cuts: More *Premier 100* executives saw increases last year than decreases (44% increased, 33% decreased, and 22% stayed flat).

ON THE SPOT

The degree of scrutiny by top management and shareholders was less in 1991, but this year, IS is being watched more closely than ever

Percent of respondents who said scrutiny has increased since last year



In many cases, the big challenge is figuring out how to spread about the same amount of money over a lot more territory and satisfy escalating expectations in terms of impact per dollar spent.

At AMR Corp., for example, approval for new projects depends on a guarantee of 100% return on investment. Previously, says Max Hopper, senior vice president of information services, the goal might have been as low as a 15% return.

IS executives on the *Premier 100* list tell us that the eyes of management and shareholders are on them. Seventy-three percent say this scrutiny increased last year (see chart at left).

“Our markets are still terrible,” says R. D. Sonnenburg, newly named director of computer IS at Deere & Co. “In this environment, we have no choice but to keep our own costs in line.”

But simple frugality isn’t all that management and stockholders are interested in. They are also looking for information weaponry to use against increasingly aggressive competition.

Rodger Marticke, principal of the motor carrier practice at Mercer Management Consulting in Lexington, Mass., observed that “the cargo shipping wars are, in large part, being waged vis-a-vis IS.” So, in fact, are the retailing wars, the automotive wars, the financial services wars and so on.

For better or worse, companies’ awareness of IS has grown to the point that top executives expect their IS staffs to redesign processes and produce systems that offer a real competitive advantage. Eighty-five percent of the *Premier 100* leaders say they have redesigned some processes over the past year to take advantage of information technology; 80% say they have installed systems to provide competitive advantage.

Handling these critical tasks on top of the normal work load has stressed the resources of even the IS organizations

PETROLEUM AND CHEMICALS

1. Phillips Petroleum Co.
2. The Dow Chemical Co.
3. FMC Corp.
4. Unocal Corp.
5. Union Texas Petroleum Holdings, Inc.
6. Monsanto Co.
7. Ashland Oil, Inc.
8. Rohm and Haas Co.
9. NERCO, Inc.
10. Air Products and Chemicals, Inc.

PHARMACEUTICALS AND FOOD

1. Merck & Co.
2. Schering-Plough Corp.
3. Becton, Dickinson & Co.
4. Sara Lee Corp.
5. International Multifoods Corp.
6. Pepsico, Inc.
7. Bristol-Myers Squibb Co.
8. Upjohn Co.
9. Abbott Laboratories
10. Johnson & Johnson

RETAILING AND WHOLESALING

1. Wal-Mart Stores, Inc.
2. Sears, Roebuck and Co.
3. The Home Depot, Inc.
4. FoxMeyer Corp.
5. Dillard Department Stores, Inc.
6. Kmart Corp.
7. Bergen Brunswig Corp.
8. Winn-Dixie Stores, Inc.
9. Toys R Us, Inc.
10. Nordstrom, Inc.

TRANSPORTATION

1. AMR Corp.
2. Airborne Freight Corp.
3. Roadway Services, Inc.
4. Northwest Airlines
5. J. B. Hunt Transport Services, Inc.
6. International Shipholding Corp.
7. Federal Express Corp.
8. Hawaiian Airlines
9. Carolina Freight Corp.
10. Southwest Airlines

UTILITIES

1. MCI Communications Corp.
2. Bell Atlantic Corp.
3. Carolina Power & Light Co.
4. Southern Co.
5. Northeast Utilities
6. Ameritech Corp.
7. Duke Power
8. Baltimore Gas & Electric
9. GTE Corp.
10. AT&T

at these top companies. Among the chief challenges for *Premier 100* IS execs this year were reducing costs, managing more work with the same resources, educating business users, meeting strategic corporate objectives and downsizing.

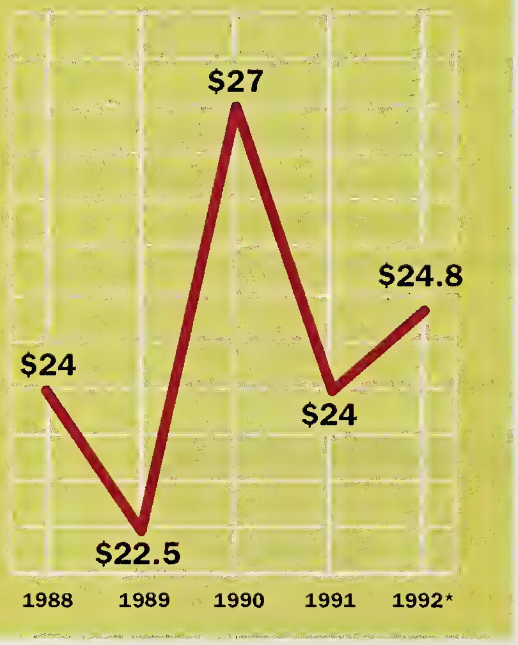
The expectations for next year are very similar, except that implementing effective process improvement and networking strategies jumps to the middle of the list.

Unifying LANs and installing T1 lines are already high priorities at many of the *Premier 100* companies, which see tighter communications links with customers and suppliers as an absolute necessity.

STABLE BUT GUARDED

After experiencing a budget free-fall in 1991, *Premier 100* IS groups, particularly in Consumer Products and Financial Services, regained some ground in 1992

Premier 100 companies' cumulative IS budgets (in billions)



*Projected

At retailer Nordstrom, Inc., for example, data processing manager Charles T. Mitchell says that partnering with suppliers has become the key to success in retailing. He points to the company's new VIP Express E-mail system as an example of how Nordstrom is trying to strengthen its supplier relationships. VIP Express gives suppliers fast and easy access to Nordstrom's geographically scattered buyers.

Fully 70% of the companies surveyed have already downsized to smaller platforms; the most frequently cited reason for this move is cost-effectiveness. Hand-in-hand with platform reduction goes the desire to move to nonproprietary systems. Seventy-eight percent of the executives say they installed some nonproprietary systems last year, and 77% say they are planning to install such equipment during the coming year.

The most prevalent theme is the IS chief's great concern with concentrating energies in areas that will produce economies and offer some appreciable business advantage.

In most instances, this means focusing on applications that will increase value to customers — rapid response and fast fulfillment systems, information-on-demand systems, customer service systems and high-level sales and marketing automation systems that provide companies with information their customers need and want.

Client/server systems, electronic data interchange (EDI) technology and networks all play major parts in achieving those goals. None come cheap enough that new infrastructures and systems can be built without some sacrifice. Intelligent trade-offs have become very important — perhaps even the single most important item separating successful CIOs from unsuccessful ones.

Some examples of how *Premier 100* IS leaders are prioritizing and allocating resources include the following:

- Johnson Controls, Inc.'s James J. Kerwin, director of information technology services for the controls group, says he is reducing spending on maintenance of old systems to concentrate resources on "systems that touch the customer directly, such as order entry."
- At Caterpillar, Inc., Robert Roof, business manager of corporate information services, is hoping to eke out money for systems to support faster delivery by cutting back on support services, which now consume 60% of the central IS budget.
- At Airborne Freight Corp., minor or cosmetic changes to existing systems, such as alterations to report formats, are absent from the priority list. This year, the emphasis is on continued improvements to Airborne's EDI systems, which are the technological building blocks for all its customer service programs.
- In most financial services companies, McKinsey & Co. principal William M. Saubert says, the spending emphasis is now on "the desktops of traders and underwriters, property and casualty adjusters, customer service reps of mutual fund companies and branch personnel." Back-office operations are being consolidated, scaled back and moved out.

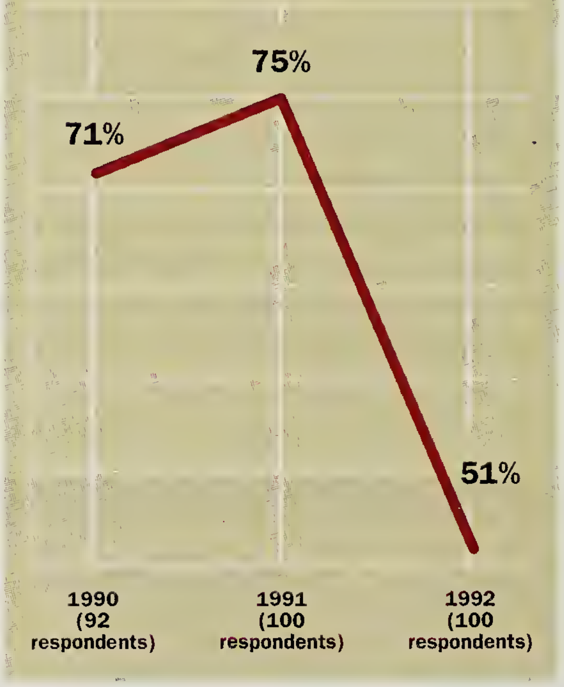
Outsourcing is an option that almost every firm has considered and a significant number have actually pursued, particularly in beleaguered industries such as financial services, petroleum and chemicals and aerospace.

Among *Premier 100* companies in aerospace alone, for example, General Dynamics Corp. outsourced its entire computing operation to Computer Sciences Corp. this year. And Martin Marietta Corp. outsourced maintenance of its dedicated telephone circuits to AT&T.

BACKING OFF THE EDGE

The importance of leading-edge systems to organizations has dropped 24% since last year

Percent of respondents who said leading-edge technology is critical or important to their organizations



An even more popular option is data center consolidation. Forty-six percent of *Premier 100* companies have already combined some centers, and 59% say they expect to do so in the coming year.

However, neither of those cost-saving alternatives comes close to the appeal of downsizing, which not only permits more flexible access to information but also gives IS departments an opportunity to lower expenditures on central maintenance and support.

At Unum Life Insurance Co., for example, CIO John Alexander describes retraining mainframe developers to handle PC development tools and educating users to function in "quasitechnical" roles. And at Union Texas Petroleum, some systems are being migrated to PC LANS, so that business departments can handle more of their own ad hoc report generation.

Right now, the technologies concerning most IS leaders are not artificial intelligence, pen-based computing, multimedia or any of the more glitzy day-after-tomorrow-type tools. In fact, the number of *Premier 100* companies rating leading-edge technology as a "critical" concern has declined precipitously in the last year (see chart page 6).

What top IS executives are more concerned about right now is figuring out what they need to do to make a bottom-line contribution to the business and locating the technologies that will help them solve today's problems.

Derek Mumford, vice president of information technologies at Eaton Corp., an OEM supplier of truck and automotive parts and appliances, gives voice to this sentiment. "We have to build on our core skills and stick to the things we do well," he says. "There are areas in which we will not be world-class."

Many *Premier 100* companies are concentrating on enhancing existing systems for EDI or, in paper-intensive industries, investing in imaging systems. The emphasis is on streamlining production and order fulfillment, improving communications with customers and distributing information more effectively.

What they'd really like more of right now, many say, are better data and systems management tools for distributed platforms.

In terms of the departments and applications receiving attention, traditional back-office areas such as finance or personnel take a back seat to sales and marketing, manufacturing and distribution. And of those, sales and marketing take the lion's share.

In most instances, the goals of these efforts range from cementing customer loyalties to finding new and improved ways to analyze information captured in the marketplace for better product planning.

At Gillette, improved analysis of point of sale data is a key target. Gillette is already using this data to anticipate customer replenishment needs and fine-tune merchandising strategies. However, Herbert Moller, director of systems operations, says he believes that better systems could produce much more actionable information. "We need to translate it [the information] into something we can act on," Moller says.

In the transportation sector, things have gone one step further. For example, companies are creating new information-based services that can be sold to existing customers interested in outsourcing some of their own high-overhead, low-return functions.

No matter what the exact strategy or whether budgets at their company increased or decreased, all *Premier 100* IS executives know two things: They are finally in the thick of the business, and the measure of success these days isn't how much iron you control, but how well you can answer the question, "What have you done for the bottom line lately?" ■

PEERLESS PERFORMERS

The following companies received the highest ratings among their industry peers. Four new companies made the ranks this year.

INDUSTRY	COMPANY
Aerospace	The Boeing Co.
Consumer Products and Services	Procter & Gamble Co.
Financial Services	Banc One Corp.
Industrial and Automotive Products	Ingersoll-Rand Co.
Manufacturing	Inland Steel Industries, Inc.
Petroleum and Chemicals	Air Products and Chemicals, Inc.
Pharmaceuticals and Food	Johnson & Johnson
Retailing and Wholesaling	Wal-Mart Stores, Inc.
Transportation	Federal Express Corp.
Utilities	Duke Power

There is perhaps no greater honor than to be called "the best" by your toughest competitors. The IS organizations named above were accorded that honor by other major players in their industries surveyed for the peer rating component of the *Premier 100* selection process.

The top reasons given by the IS executives who named these companies are as follows: The firms use information systems most effectively for competitive purposes; they are an outstanding example of how IS can be integrated into company strategy; they obtain the best bottom-line advantage from information systems; and they combine cost-effectiveness with savvy applications strategies. ■

CONSULTANTS RANK PREMIER 100 LEADERS

Leading IS consultants were asked to pick who they thought were the most effective users of information systems among the *Premier 100* target group of 600 companies. Their selections, which were not included in the *Premier 100* scoring system, agree with the peer selections of industry leaders in the cases of AMR Corp., Banc One, Boeing and Wal-Mart Stores. But they vary greatly after that, with AT&T, The Dow Chemical Co., Ford Motor Co., General Electric Co., Humana, Inc. and Merck & Co. rounding out the rest of the 10 industries. All but GE made the Top 10 within their industry in this year's *Premier 100*. ■

Contrary to popular opinion,

we like

mainframes.

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

We're some of their biggest supporters.

It may sound odd for a $3.6 billion company known for client-server computing to express support for mainframes.

The fact is, however, that business still relies on mainframes for running major applications. And we know it.

But business need not rely on mainframes exclusively. Those MIS managers who have seen the future recognize that many mainframe applications, like databases, can be safely distributed throughout the company, close to the people who actually use them.

It's that vision of client-server computing that we at Sun™ have made practical today. Already, we are helping companies like Kodak, Salomon Brothers and US WEST position their computing for lower costs and higher productivity. By working with existing mainframes, and distributing applications with Sun workstations and servers.

The results: flexible computing, higher profits, quicker response time.

Sound intriguing? To learn more, simply call 1-800-426-5321, ext. 500. We think you'll hear a very supportive story.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Do it smart and do it *once*

Beleaguered industry emphasizes streamlining and waste reduction

▶ BY KATHLEEN GOW

COLLINS *says applications are Boeing's future*

The last 12 months have been a rough ride for the aerospace industry. While the U.S. defense budget continued to shrink, the commercial airline industry posted one of its worst years in 1991. Despite a couple of bright spots — a $1.6 billion increase in spending for the Strategic Defense Initiative and expected increases in NASA outlays — contraction remains the primary mode in the more defense- and government-oriented sector.

Foreign competition is also a growing factor. U.S. share of the worldwide aerospace market has slipped considerably during the past few years, from 73% in 1985 to 58% in 1990, according to the Aerospace Industry Association of America.

In the commercial sector, The Boeing Co. still dominates, with about 60% of the world market for commercial aircraft. But McDonnell Douglas Corp. was displaced from its traditional No. 2 spot by Airbus Industries, the European consortium financed by the governments of France, Germany, Spain and the UK.

Information systems organizations are feeling the effect of business downsizing. Many have lost budget ground, and most are operating in cost-cutting mode. Data center consolidations are common, and a number of companies have outsourced some significant IS functions.

KEY TECHNOLOGIES

NOW
- LAN applications
- MRP II
- Imaging applications
- Software development

NEXT FIVE YEARS
- Open systems
- CIM

Despite these economies, *Premier 100* aerospace companies still see IS as the key to enhanced efficiency and profitability through diversification.

Heavy stress is being placed on distributed processing. According to Norm Collins, vice president and general manager of IS at Boeing, client/server platforms are seen as the future there. "For new applications, especially where we are making dramatic process changes, we almost always favor a distributed architecture because it brings more graphics functionality to the table."

1

The Boeing Co.

Seattle-based Boeing, the world's leading manufacturer of commercial aircraft, is also the leading manufacturing exporter in the U.S. With an order backlog of about $90 billion, the $29 billion company is in no danger of being edged out of the sky.

If cutbacks in Northrop Corp.'s B-2 bomber program — for which Boeing is a subcontractor — and drops in orders for 737s have caused a pinch, Boeing was not about to let IS feel it. In fact, the company bucked the industry trend in 1991 by increasing its IS budget 23% to $1.6 billion. IS staff grew 4% to top 14,000, while installations of personal computers and terminals grew 18% to 122,600. These IS investments were partially fueled by the ramp-up of Boeing's 777 passenger plane program, due for delivery in 1995.

The wide-body, two-engine 777 is being built with the help of three-dimensional computer-aided design (CAD), which Collins says means far

PHOTOGRAPHY BY RICH FRISHMAN

fewer mistakes and significant savings from reduced cycle time.

2

Grumman Corp.

Grumman, a $4 billion company in Bethpage, N.Y., is responding to defense cuts by using systems technologies to drive costs down and functionality up. The company's strategy is based on high-powered workstations in a distributed environment, extensive use of imaging and links between local- and wide-area networks to handle high-speed, high-volume transactions.

Like most of its competitors, Grumman trimmed its 1992 IS budget. A 4% cut brought the funding level to $153 million, and the IS staff was cut by 25% to 1,500. Grumman is currently examining how it delivers services to internal customers to ensure that its practices and procedures align directly with business needs.

The company has centralized many shared services during the last several years by consolidating data centers. Most application, workstation and PC areas have remained decentralized, but the company is looking at further consolidation to eliminate redundancies and streamline operations.

3

McDonnell Douglas Corp.

McDonnell Douglas, the top U.S. defense contractor and the world's third-largest maker of commercial aircraft, responded to declining industry revenue with major IS initiatives centered around cost. The $18.7 billion company has been examining architectural options for the last several months, including increased reliance on Unix-based workstations. It has also been weighing the possibilities of outsourcing data center or application development services.

Last fall, McDonnell began a yearlong data center consolidation, which will fold seven operations into two.

McDonnell's IS budget slipped 2% in 1992 to $683 million, while IS staffing fell 5% to 3,500. Support for training stayed strong, however, as did the company's commitment to end-user computing.

INDUSTRY LEADERS

1. **Art Hitsman**
President, Boeing Computer Services
The Boeing Co.
2. **William D. Rizzardi**
Corporate V.P., Information Management
Grumman Corp.
3. **Leonard J. Deney**
V.P., Information Resource Management
McDonnell Douglas Corp.
4. **Raymond J. Wiltshire**
V.P., Computer-Aided Productivity
Martin Marietta Corp.
5. **Dean O. Allen**
V.P., IS
Lockheed Corp.
6. **Robert Sexton**
Corporate Director, IS
Raytheon Co.
7. **J. F. Sutter**
V.P. and General Manager
Rockwell International Corp.
8. **Cecil W. Labhart**
V.P., IS
Textron, Inc.
9. **Herbert Anderson**
V.P. and Center General Manager
Northrop Corp.
10. **Asaph H. Hall**
V.P. and General Manager
General Dynamics Corp.

4

Martin Marietta Corp.

Revenue was flat and profits were down in 1991 at Martin Marietta in Bethesda, Md. With the anticipated cancellation of some of its defense contracts (the Peacekeeper missile and the Air Defense/Anti-Tank system), the diversified aerospace company's plans include aggressive expansion into nondefense markets.

CHALLENGES

- Managing increased user demands
- Customer satisfaction

The company's IS budget for 1992 dropped 6% from the previous year to $301.3 million, and the IS staff was cut 14% to 1,900. The company is moving from a two-tiered (host/workstation) architecture to a three-tiered setup, with many mainframe-based applications moving onto servers.

Martin Marietta is also exploring the use of fiber-optic networks, computer-aided software engineering and rapid application development tools.

5

Lockheed Corp.

Lockheed in Calabasas, Calif., is the leader of the team building the U.S. Air Force's new Advanced Tactical Fighter, the F-22. But the $9.8 billion company's long-term strategy is to decrease its dependence on defense and transfer internally developed IS skills and expertise into commercial endeavors.

The major challenges for IS are to reduce service delivery costs while using technologies such as imaging and expert systems to improve performance and cost-allocation processes.

In a major cost-cutting initiative, Lockheed established a company called Lockheed Information Technology to consolidate the company's large-scale and high-performance computing services in one world-class data center. By eliminating duplications of platforms, software and services, the company predicts an annual savings of 25% to 30%. The consolidation will take place during the next 18 to 24 months.

6

Raytheon Co.

Although most widely known as a missile and radar provider, Raytheon also produces commercial aircraft

(Beech), manufactures appliances, builds chemical and power plants and publishes books. This diversification into commercial markets has helped the $9.4 billion company insulate itself from the effects of defense cuts. Still, the downturn in defense business has brought changes.

Raytheon has steadily reduced its IS staff during the past several years, and the head count dropped another 7% this year to 1,150. This year the IS budget also fell sharply, dropping from $197 million in 1991 to $105 million in 1992.

Raytheon's strategies to stay lean and mean include standardization of systems, consolidation of resources (it is folding an IBM 3090-class computer center in Waltham, Mass., into another in nearby Andover), the purchase of remarketed systems and investment in "paperless" design and procurement systems. The company has also started scanning "legacy" engineering drawings into image-based systems with new drawings going directly to electronic media via CAD.

7

Rockwell International Corp.

Despite defense industry woes and the completion of its Endeavor space shuttle, top NASA contractor Rockwell International increased its IS budget 10% to $285 million for 1992. That increase helped to fund a number of important technology initiatives, such as enhancing systems for materials management and integrating engineering and manufacturing databases into a single large system called the Enterprise Product Data Management.

Rockwell is also replacing large-scale and midrange computers with reduced instruction set computing (RISC)-based workstation technology and increasing its use of imaging technology to facilitate cooperation with customers and partners in product design and manufacturing.

Despite the IS budget increase and Rockwell's unflagging commitment to training, IS is not exempt from the need to watch costs. Staff in that area was cut 10% in 1992 to 2,464, reflecting the consolidation of two data centers. Sales declined 3% in 1991 to just over $12 billion, and profits fell 4% to $601 million. Overall employee head count dropped 15% to 87,000.

DEFINING REALITIES

BUDGETS

Well over three quarters of the leading aerospace companies said their budgets decreased last year, and most expect further reductions.

PRESSURES

Shrinking defense dollars are causing companies to closely examine IS and cut back or outsource where they can. Process redesign and downsizing are also being considered.

ORGANIZATIONAL CHANGES

Well over three quarters of these companies have a mixture of centralized and decentralized IS operations. Most of these companies plan to consolidate or merge data centers in the coming year.

PLATFORM CHANGES

Aerospace leads the way in the move to smaller platforms.

8

Textron, Inc.

The economy was good to Providence, R.I.-based Textron in 1991: the company recorded a net income for the year of $300 million, up 6% from the year before, and the result for IS was a $169 million budget for 1992.

The company's 35 subsidiaries fall into three sectors: aerospace technology, commercial products and financial services, split evenly between defense and commercial markets. The company acquired Cessna Aircraft Co. in Wichita, Kan., this spring from General Dynamics for $600 million.

Textron Aerostructures, which manufactures wings and wing components, has shifted emphasis from mostly defense sales three years ago to about 80% commercial aerospace sales today. Through total quality management programs and an employee-supported asset management program, Textron hopes to reduce cycle time.

9

Northrop Corp.

In 1991, Los Angeles-based Northrop saw additional cuts to its flagship B-2 Stealth Bomber program and a lost bid to build the Air Force's Advanced Tactical Fighter in partnership with McDonnell Douglas.

The $5.7 billion company has been reshaping itself for leaner times and greater flexibility for some time, however. In 1991, it instituted a number of changes in its IS organization, which saved $25 million. These included consolidating and centralizing the responsibilities of the IS vice presidents who used to manage each of the company's Southern California locations, consolidating its applications, programming and telecommunications groups and reducing the number of large mainframes from 31 to eight.

Savings of another $25 million are projected for this year. Northrop is also putting together a five-year technology architecture plan to move toward a client/server environment.

10

General Dynamics Corp.

General Dynamics moved back into the Top 10 this year, after falling to No. 12 in 1991 and holding the No. 1 spot in 1990 and 1989. It was a busy year for the company, moving its headquarters from St. Louis to Falls Church, Va., last January. Chairman Stanley Pace retired in 1991 and was replaced by William A. Anders.

To counter the reduction in defense spending, $9.5 billion General Dynamics is withdrawing from noncore markets, reducing risk and, where possible, replacing fixed costs with variable ones. It sold its Cessna Aircraft subsidiary to Textron and its missile systems divisions to Hughes Aircraft Co. It also outsourced its computing operations to Computer Sciences Corp. (CSC) in November 1991 under a 10-year, $3 billion agreement.

CSC is providing General Dynamics' aerospace and defense units with systems development, data center management, network operations and other technical services. In an initial six-month review, users said the change has been totally transparent.

General Dynamics is pursuing improvements in cash flow and cost control through electronic data interchange and materials management. ■

Gow is a free-lance writer based in Medford, Mass.

Consumer Products and Services

Catering to the customer

Well-stocked store shelves keep retailers happy

▸ BY BARBARA FRANCETT

READER'S DIGEST'S *Nelson leads IS globalization effort*

INDUSTRY LEADERS

1. **Kenneth A. Nelson**
   V.P., MIS
   Reader's Digest Association, Inc.
2. **F. R. Caccamo**
   Manager, Management Systems Division
   Procter & Gamble Co.
3. **R. William Eaton**
   CIO and Senior V.P.
   Levi Strauss Associates, Inc.
4. **Herbert Moller**
   Director, Systems Operations
   Gillette Co.
5. **Leonard L. Hendrickson**
   Director, IS
   American Brands, Inc.
6. **Michael S. Field**
   Executive V.P.
   The Dun & Bradstreet Corp.
7. **Edward J. Heresniak**
   Senior V.P., Computer Services
   McGraw-Hill, Inc.
8. **Thomas J. Gildea**
   V.P., Business IS
   Helene Curtis Industries, Inc.
9. **Fred Pirman**
   Senior V.P., IS
   Humana, Inc.
10. **James J. Kerwin**
    Director, IS
    Johnson Controls, Inc.

Always competitive, the consumer products industry is now downright predatory. Companies are trying everything to increase market share.

In most instances, the best way to wrest share away from the competition is by gaining the retailers' favor. Consumer products companies are attempting to do that by improving delivery efficiency and shouldering a number of tasks, including product ordering, inventory management and payment processing. Procter & Gamble Co., for instance, has taken over purchasing and inventory management for its products at Wal-Mart Stores, Inc. sites.

Collection and analysis of point-of-sale (POS) data contributes to another strategy that's gaining momentum in the consumer products industry: micro merchandising, or the ability to integrate fine-grained information from a number of sources to determine where a product is most likely to sell and what combination of products is best for specific locales.

1

Reader's Digest Association, Inc.

Global unity is the theme these days at Reader's Digest in Pleasantville, N.Y., which, with its range of direct marketing businesses, is actually its own best information customer. "Our businesses around the world have been operating independently. Now, a two-year program is under way to globalize the business," says Kenneth A. Nelson, vice president of MIS.

The $2.4 billion publisher and direct-mail marketer operates in more than 50 locations worldwide. It publishes its namesake magazine in local editions around the world rather than

Continued on page 16

PHOTOGRAPHY BY JOYCE RAVID

Salomon Brothers

Global trading
Global networking
Client driven
2,000 Sun workstations and servers.

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCstation is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

In the competitive world of global finance, the ability to respond to your clients' needs and to the demands of the marketplace are the critical factors for success.

In 1989, Salomon Brothers, a leading investment banking and securities institution, made a strategic decision to transform their technology infrastructure. This decision, involving distributed systems design and Sun Microsystems,® gave Salomon a competitive edge.

Linked globally through Salomon's internal network, hundreds of salespeople, traders, research analysts and support professionals are linked together 24 hours a day—every market day.

This system was built by Salomon with Sun™ SPARCstations™ and servers as the information delivery platform of choice.

If you would like to gain your own competitive advantage, call Sun Microsystems at 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 13

translate a U.S. version. The local editions feature local advertising, and the reader responses to those ads are fed into databases for direct marketing of other products such as books and home video packages.

This year's $120 million information systems budget (up from $98 million last year) is earmarked for a five-part program that began last year, which includes an international communications network and the creation of a portfolio of common business applications.

CHALLENGES

- Moving more quickly to production
- Process improvement

CONSUMER PRODUCTS *companies use IS to compete for limited shelf space*

2
Procter & Gamble Co.

Procter & Gamble has forged strong partnership arrrangements with its retailers through swift responses in product replenishment and a variety of technology-supported value-added services.

For customer/partner Wal-Mart, Procter & Gamble handles inventory management and purchasing for some of its products. It also uses Wal-Mart's POS data to replenish stock automatically.

Long known for its outstanding brand management capability and market research, Procter & Gamble has shown interest in expanding its global presence by tapping developing markets in eastern Europe, Latin America and the Far East. The $27.4 billion company spends $237 million on IS.

3
Levi Strauss Associates, Inc.

Consumers can't buy apparel that isn't on the racks, so Levi Strauss emphasizes paring product delivery times to keep enough merchandise available to meet consumer demand without piling up excess inventory.

Order, inventory and delivery management are the goals of the LeviLink system, which connects Levi Strauss to its suppliers and trading partners.

Making sure that the information collected using LeviLink is then applied to turning out deliverable products is the job of another internal system, Levi's Advanced Business System.

KEY TECHNOLOGIES

NOW

- DBMSs
- LAN applications
- Networks

NEXT FIVE YEARS

- Sales force automation
- Client/server systems
- Open systems

On the manufacturing side, computer-integrated manufacturing, including computer-aided design and manufacturing systems, cuts production time and speeds merchandise out of the plant.

Bill Eaton, senior vice president and chief information officer at the San Francisco-based company, says the differentiator between Levi Strauss and some of its competitors is not that it uses information technology that is so much more advanced but that it applies IS to "the full array of business processes."

4
Gillette Co.

This $4.7 billion Boston-based maker of personal care products derives more than 65% of its sales income from overseas markets. Corporate IS sets strategic directions for its far-flung business units, each with its own IS operations support.

Gillette's IS budget — about $120 million this year — continues to grow. During the past year, developing business units in Latin America, Asia and the Pacific Rim have concentrated on establishing client/server computing systems and using off-the-shelf software packages wherever possible, according Herbert Moller, vice president of corporate MIS. Moller notes that it is easier to "start fresh" with newer units.

Business units in the more mature competitive markets of the North Atlantic region are focusing on technologies that support distribution and logistics, such as electronic data interchange and POS data collection and analysis.

5
American Brands, Inc.

The chief IS challenge at this highly diversified, $8.4 billion company is to formulate specific responses to the unique competitive conditions in each of its five core businesses: American Brands and Gallaher Ltd. tobacco products, Jim Beam Brands Co. distilled spirits, Master Brands Industries hardware, ACCO World Corp. office products and Franklin Life Insurance Co.

While each company functions autonomously with a distinct IS group and strategic business plan, all benefit from

PHOTOGRAPHY BY GERARD FRITZ/TONY STONE WORLDWIDE

COMPUTERWORLD

Professional Courtesy Rate

YES, I want to receive my own copy of Computerworld each week. I accept your offer of $38.95* for 51 weekly issues.

Address is: ☐ Home ☐ Business Basic rate: $48 per year.

* U.S. Only. Canada $74.97, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Name Title

Company

Address

City State Zip

Please complete the information below to qualify for this special offer.

1. BUSINESS/INDUSTRY (Circle one)

- **10.** Manufacturer (other than computer)
- **20.** Finance/Insurance/Real Estate
- **30.** Medicine/Law/Education
- **40.** Wholesale/Retail/Trade
- **50.** Business Service (except DP)
- **60.** Government - State/Federal/Local
- **65.** Communications Systems/Public Utilities/Transportation
- **70.** Mining/Construction/Petroleum/Refining/Agric.
- **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
- **85.** System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- **90.** Computer/Peripheral Dealer/Distr./Retailer
- **95.** Other ______________ (Please specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

- **19.** Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
- **21.** Dir./Mgr. MIS Services, Information Center
- **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
- **23.** Dir./Mgr. Sys. Development, Sys. Architecture
- **31.** Programming Management, Software Developers
- **41.** Engineering, Scientific, R&D, Tech. Mgt.
- **60.** Sys. Integrators/ VARs/Consulting Mgt.

CORPORATE MANAGEMENT

- **11.** President, Owner/Partner, General Mgr.
- **12.** Vice President, Asst. VP
- **13.** Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- **51.** Sales & Mktg. Management
- **70.** Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

- **80.** Educator, Journalists, Librarians, Students
- **90.** Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/ information systems/data processing/communications systems? (Please check only one)

☐ YES ☐ NO

♲ *Recycled Paper* E42JP-2

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD
P.O. Box 2044
Marion, Ohio 43306-2144

volume purchase agreements for hardware, software and services, says Leonard Hendrickson, director of IS.

The Master Brands Industries hardware and ACCO office products companies concentrate their technology investments on efficient customer support systems, including inventory control, warehouse management and distribution systems. The American Brands and Gallaher tobacco products companies have focused on improving their manufacturing support systems with more sophisticated manufacturing resource planning systems as well as handheld computers.

6

The Dun & Bradstreet Corp.

If there's a word that characterizes Dun & Bradstreet this year, it's "transition." Following several years of double-digit growth, the $4.6 billion diversified financial information provider experienced a decline in earnings last year. It responded by reorganizing and pruning business units and by cutting costs. Nevertheless, Dun & Bradstreet is steadfast in its commitment to technology.

The company's business information group continues to aggressively pursue ways to leverage Dun & Bradstreet's vast information resources and to provide lower cost, real-time information services to its directory, marketing and financial information services customers.

7

McGraw-Hill, Inc.

Technology provides the underpinnings for the varied publishing and information services businesses of McGraw-Hill in New York.

"Our four corporate goals are to grow the business, use technology to leverage the business, expand globally and cut costs," says John Dobilas, senior vice president of IS and technology.

Two groups, the Technical Advisory Committee and the Applications Coalition, enable the company's businesses to share applications, design information and maintain compatibility so that solutions are transferable among businesses.

Despite a flat overall IS budget (an estimated $166 million), several important projects were launched in the past year. Financial services company Kenny S&P, for example, reduced its large-scale platforms to small, multivendor client/server systems with Unix processors and graphical user interfaces and, based on the results at that unit, client/server systems are being rolled out to other groups.

8

Helene Curtis Industries, Inc.

Since all growth at Helene Curtis is internally generated (no acquisitions of companies or brands), its market share in the hotly competitive personal care segment must be earned. Right now, the company is trying to earn its share by beating the competition at logistics management, particularly order processing and distribution.

DEFINING REALITIES

BUDGETS

Well over half the companies in this category increased IS budgets this year, and slightly over half of the IS managers expect another increase next year.

PRESSURES

Well over three quarters said they were under increased scrutiny from the top executives and shareholders this year. Application development backlog is a significant concern, with just under half of the companies surveyed reporting that it had worsened over the past year.

ORGANIZATIONAL CHANGES

Decentralization of IS is prevalent. In fact, this industry has the smallest reported incidence of IS centralization.

PLATFORM CHANGES

Downsizing to smaller platforms is a major trend. Well over three quarters made moves of this type this year, primarily for cost reduction and cost-effectiveness but also to allow greater user involvement.

"The goal is to squeeze as much time out of the order cycle as possible," says Thomas J. Gildea, vice president of business information services.

Recently named Vendor of the Year by Wal-Mart, the company isn't resting on its laurels. A hefty increase in the IS budget — up 10% to $30 million — is being directed toward technology investments that will improve service. For example, enhancements are being made to the sales information system, which will allow representatives to offer immediate competitive analyses.

9

Humana, Inc.

A flat business cycle has produced lean times at Humana, a Louisville, Ky.-based health care company. The company, which operates 78 hospitals, has declared a hiatus from acqusitions, which had been a primary source of growth. It is also trying to recover from the migration of some of its patients to lower cost facilities for some treatments.

The IS budget is down to $90 million, representing a reduction of 50% in capital expenditures and of 8% to 10% in operating funds, says Fred Pirman, senior vice president of IS. Several major productivity-oriented initiatives continue, such as an imaging system for insurance claims operations that was recently rolled out to three processing centers.

10

Johnson Controls, Inc.

At Johnson Controls, a Milwaukee-based manufacturer of temperature, lighting and energy controls, as well as automotive systems, plastic containers and automobile batteries, IS has focused on aligning its goals with business strategies.

"There was a bit of disconnect between IT's directions and priorities and those of the business," says James J. Kerwin, director of information technology services at the controls group. To address that problem, the company enlisted external consultants to help map its technical infrastructure and organized cross-functional project teams of business and IS staff members.

Future strategies will continue to emphasize responsiveness to customers, Kerwin says, and phasing out legacy systems is on the near-term agenda. ■

Francett is a free-lance writer based in Bloomfield, N.J.

Growth is relative

Budgets are bigger, but so are expectations

▸ BY ALICE LAPLANTE

After four years of multimillion-dollar losses and bad loan write-offs, the financial services industry is at last showing signs of revival. Revenue — and more importantly, profits — is up at the leading financial institutions.

That sounds like good news for information systems managers, and it is . . . sort of. Although the strongest financial institutions have indeed increased budgets — and, to a lesser degree, head counts — many, especially banks, have also absorbed dozens of other institutions. In other words, slightly more money and personnel are being stretched over a lot more territory.

IS staffs at the top companies are being asked to develop systems and architectures that will allow efficient and cost-effective servicing of expanding customer populations and to provide products of a consistently high quality at a lower per-unit cost.

There's one story that all *Premier 100* financial services firms tell: how they are slashing costs in back-office operations to put money and personnel into all-important front-office development efforts.

Self-service technologies are also a major focus of systems efforts. Financial services firms, for example, are moving strongly into systems that allow customers to use telephone and home computers to access accounts.

1 J. P. Morgan & Co.

Earnings at the global holding company, which provides a wide range of banking, underwriting, trading and investing services to corporations, governments and individuals, rose an astonishing 44% in 1991, for a net income of $1.1 billion.

With its 1992 IS budget of $510 million, J. P. Morgan is pursuing a two-part goal: reduce costs wherever possible and funnel dollars into development of desktop systems. That was the impetus for the outsourcing arrangement with BT North America, Inc., which is expected to save more than $12 million over five years, and the decision to consolidate support for London and Paris operations into the data center in Delaware.

Savings from such moves are being used to develop sophisticated local-area network-based front-office applications around the world. Morgan just completed a major project connecting its international office LANs and is developing a Unix-based securities processing system that will allow dealers to input trades on the desktop and automatically reconcile host-based transaction processing systems.

Last year, J. P. Morgan established an advanced technology group. The major challenge now is training IS employees on Unix, LAN and emerging object-oriented technologies.

INDUSTRY LEADERS

1. **Peter L. Woicke**
   Managing Director
   J. P. Morgan & Co.
2. **Richard F. Morrison**
   Senior V.P. and CIO
   Primerica Corp.
3. **Robert L. Barrett**
   President, Banc One Services Corp.
   Banc One Corp.
4. **Robert N. Gilmore**
   Executive V.P., Technology
   CoreStates Financial Corp.
5. **F. J. Ward**
   Executive V.P., Operations
   KeyCorp
6. **Martin A. Stein**
   Executive V.P., CIO
   BankAmerica Corp.
7. **Jonathan Palmer**
   Chief Technology Executive
   Barnett Banks, Inc.
8. **John J. Alexander Jr.**
   CIO
   Unum Life Insurance Co.
9. **Carmine Vona**
   Executive V.P.
   Bankers Trust New York Corp.
10. **John J. Pajack**
    Executive V.P.
    Massachusetts Mutual Life Insurance Co.

2 Primerica Corp.

The expressed goal of Primerica, a $21.5 billion consumer finance, investment and insurance services company, is to be a low-cost provider in realms that include consumer lending, investment banking, securities brokerage, asset management and personal and property insurance.

Achieving this means maintaining a low-cost corporate culture everywhere, including IS. In 1992, Greenwich, Conn.-based Primerica continued its consolidation of data centers by folding six corporate centers into four. It also moved a number of strategic host-based systems onto LANs. To control costs, business managers have bottom-line responsibility for application development projects.

A variety of client/server projects are under way, including a commercial credit system that will move intelligent processing out to branch offices. Funding continues for investigating emerging technologies such as imaging, which may help to further reduce costs.

3

Banc One Corp.

IS helped Columbus, Ohio-based Banc One make 1991 its most successful year ever. With profits up 25%, the retail banking giant continued rapid growth by acquiring new banks at an average rate of one per month, and it ended 1991 with assets exceeding $46 billion.

A SWAT team of 150 conversion experts from Banc One Services Corp., the IS arm of Banc One, descends on new acquisitions and converts them to standard Banc One hardware and software literally overnight. With an IS budget of $293 million and 1,650 employees, Banc One Services offers acquired banks IS services and support at 90% of market price, in addition to providing credit-card and check processing/settlement for credit unions, brokerage houses and nonaffiliated banks.

Last year, Banc One began implementing a suite of client/server applications called the Strategic Banking System. Co-developed with Electronic Data Systems Corp. at a reported cost of more than $100 million, this enhanced customer service system has so far resulted in 10% to 20% savings.

4

CoreStates Financial Corp.

CoreStates Financial Corp is using technology to help it expand in all of its main businesses: wholesale banking, retail banking, trust and investment banking and electronic payment services. Last year, Philadelphia-based CoreStates doubled business handled by its electronic payment services group by acquiring BuyPass the System, Inc., the largest third-party provider of processing services for point-of-sale transactions.

The company, which is growing its international business at a 30% annual rate, also redesigned its international processing systems by defining a distributed architecture for all offshore operations.

J. P. MORGAN'S WOICKE *balances cost reduction with strategic investment*

CHALLENGES

- Cost reductions
- Managing more work with same resources
- Remaining technologically effective

KEY TECHNOLOGIES

NOW

- Imaging applications
- Expert systems
- Telecommunications

NEXT FIVE YEARS

- Client/server systems
- EISs

CoreStates intends to put $103 million into IS spending in 1992 — a figure that is slightly up from the previous year — and hold IS staffing steady at 700 employees.

5

KeyCorp

IS is literally part of the company's growth strategy at KeyCorp. When KeyCorp, one of the fastest rising financial holding companies in the country, is considering an acquisition, it sends in an advance analysis team that includes senior IS executives. Their job is to determine whether a smooth and cost-effective systems consolidation is possible.

IS hasn't been forgotten in terms of funding, either. Its budget will be a healthy $48.7 million in 1992, up $8 million from 1991. Staffing is up, too. When KeyCorp acquired Gold Dome Savings Bank in Buffalo, N.Y., last year, it retained the programming staff to help meet a growing backlog.

During the past year, roughly half of KeyCorp's systems and programming resources were spent on converting acquired banks to the KeyCorp systems architecture.

6

BankAmerica Corp.

Consolidating gains has been the emphasis at BankAmerica since its $4.4 billion acquisition of Security Pacific Corp. Absorbing, standardizing and

PHOTOGRAPHY BY JOYCE RAVID

streamlining are still big chores for IS. In 1992, BankAmerica sold its $125 million payroll processing unit to ADP Network Services, which cleared the decks for large-scale systems development projects made necessary by the merger.

Although BankAmerica's 1992 IS budget has not been finalized, the goal is to cut 25% from the combined spending of the two institutions. One major step was the consolidation of Hong Kong and Frankfurt data center operations into a center in Croyden, England, at an estimated savings of more than $1 million per month.

But thrift does not mean inactivity on the development front. Last year, the network systems management group developed a change management tool that simultaneously downloads software to more than 1,000 desktop workstations from the corporate data center in Concord, Calif.

7

Barnett Banks, Inc.

The IS arm of Jacksonville, Fla.-based Barnett Banks has set a goal of earning $1 for every 60 cents invested in systems.

All IS services for the $43.2 billion bank holding company and its 32 retail banks are provided by a wholly owned $220 million subsidiary, Barnett Technologies, Inc.

The IS group's main strategy is to gradually reduce the dependence of bank operations on expensive, centralized data centers by moving strategic applications to a distributed architecture. More than $50 million will go toward reorganizing all operations around a distributed system built on IBM Token Ring LAN technology. More than 10,000 IBM Personal System/2 machines are scheduled to be in place by the end of this year.

The IS department has also developed a state-of-the-art imaging system for check processing, which will be rolled out during the next five years.

Although the $75 million IS budget is up $20 million from 1991 and the capacity of the data center has been increased threefold in the last two years, Barnett Technologies has reduced its staff by 400 workers, to 3,200, to help meet the profitability goals set by its parent. The bank's profits rose 22% in 1991 to $123.8 million.

DEFINING REALITIES

BUDGETS

The number of companies reporting IS budget increases actually ran well ahead of the average for all industries surveyed, and more than three quarters anticipate increases next year.

PRESSURES

Resources are being claimed by systems deemed to offer competitive advantage. The vast majority of companies said they had installed systems of this type over the past year. At the same time, 100% said they had evaluated outsourcing.

ORGANIZATIONAL CHANGES

More than half of the companies report having consolidated some data centers this year. More than three quarters expect to do so next year.

PLATFORM CHANGES

More than half said they've done some downsizing over the past year, but this industry is far less active than most when it comes to downsizing.

8

Unum Life Insurance Co.

A specialty insurance company with assets totaling $10.3 billion, Portland, Maine-based Unum is a leader in two relatively underpenetrated markets: disability and long-term care. With relatively little competition, Unum continues to expand rapidly at a time when other insurance firms are struggling. Indeed, Unum's IS staff's biggest challenge is managing growth.

Unum is determined to place more power in the hands of business users. A new OS/2-based client/server claims processing application has been implemented on a Token Ring network, and other plans for cooperative processing projects are on the boards. Business users are receiving tools and training that will allow them to assume "quasi-technical" roles.

9

Bankers Trust New York Corp.

With net income at an all-time high of $667 million last year, Bankers Trust decided the time was right for major changes in systems architecture that would create consistent applications across its decentralized structure. In 1991, the company finished plans for a bankwide architecture that will move the company from a character-based 3270 computing mode to a client/server architecture using graphical user interface systems.

This is the year Bankers Trust will begin worldwide client/server implementation and will interconnect disparate LANs and wide-area networks into a global enterprisewide network.

10

Massachusetts Mutual Life Insurance Co.

Careful and conservative investment practices have helped Springfield, Mass.-based Mass Mutual escape most of the travails that have afflicted the financial services industry. The $5 billion company has the strongest capital base in the industry, as well as top bond ratings from Standard & Poor's Corp. and Moody's Investor Service, Inc. Throughout the organization, which is one of the largest insurance concerns in the country, the emphasis is on frugality and targeted investment.

Last year, Mass Mutual implemented the bulk of its new, multistage Horizon project, which involves overhauling most applications for distributed processing. Eventually, all field and home-office personnel will be tied into a new distributed environment, which includes an on-line link with medical providers, as well as client management and office automation facilities.

A distributed on-line transaction processing system that divides processing between the Springfield data center and a new facility in Ireland was also completed last year. The system has increased insurance claims processing productivity by 40%.

All of this has been accomplished in a year when the IS budget was reduced from $78 million to $71 million. Field maintenance of personal computers and LANs was outsourced at an estimated annual savings of $600,000, and a deal with AT&T is expected to provide volume discounts on voice and data transmissions. ■

LaPlante is a free-lance writer based in Palo Alto, Calif.

New spirit of conservatism

This is not the time for experimentation

▶ BY MARK MEHLER

INDUSTRY LEADERS

1. **Henry Paulsen**
   Director, IS
   Dresser Industries, Inc.
2. **Donald Lee**
   Acting V.P., Worldwide IS
   Black & Decker Corp.
3. **Robert P. Hinds**
   Director, Corporate IS
   Caterpillar, Inc.
4. **Richard Kolbe**
   Director, MIS
   Harley-Davidson, Inc.
5. **Derek Mumford**
   V.P., Information Technology
   Eaton Corp.
6. **S. I. Gilman**
   Executive Director, IS
   Ford Motor Co.
7. **P. F. Ohman**
   V.P., Engineering, Information Technology
   Deere & Co.
8. **Bruce Carlson**
   General Manager, IS
   Paccar, Inc.
9. **John Sanford**
   Director, Corporate DP
   Trinity Industries, Inc.
10. **George Tabback**
    Manager, Corporate DP
    Ingersoll-Rand Co.

DRESSER INDUSTRIES' PAULSEN *targets EDI applications*

When the going gets tough, the tough start thinking. At least that's the philosophy Ford Motor Co.'s Jim Cnossen follows.

This is a time to tap IS resourcefulness, not look for new resources, says Cnossen, manager of the company's North American systems. It is also a time for pursuing practical gains rather than making experimental leaps.

Cnossen's peers at companies in the top ranks of the industrial products and automotive industries all seem to agree. It's better to forgo leading-edge technologies, they say, in favor of more modest systems that reduce costs, improve customer service and shorten delivery cycles.

Most of the *Premier 100* companies in this category have launched extensive electronic data interchange (EDI) programs during the past two years. "In a period of tight money, [EDI] is a perfect fit with the goals of the organization: lower inventories, faster deliveries, just-in-time manufacturing," says Henry Paulsen, director of information services at Dresser Industries, Inc., a Dallas-based oil field equipment supplier that tops the category this year.

Continued on page 24

PHOTOGRAPHY BY DAN BRYANT

In 10 years we've taken UNIX
and taught it to speak a new language.

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCstation is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. All orher products or service names mentioned herein are trademarks or registered trademarks of their respecrive owners.

The language of Business.

If computers working harder and people working smarter are the words corporate managers need to hear these days, then let us introduce you to an operating environment fluent in the language.

Solaris.®

Solaris is a remarkably powerful operating environment that allows your computers to work together, your people to work in groups, and your business applications to be run all at the same time.

Built on the powerful UNIX operating system, Solaris adds productivity features such as multiprocessing, ease-of-use through an intuitive graphical user interface, and the ability to easily administer your entire enterprise.

More than 500,000 systems are already running on Solaris, making it the world's largest installed UNIX base. Indeed, the Solaris environment is found in every Sun SPARCstation™ and SPARCserver.™

And Solaris is fully backed by 550 third-party development tools, and supported by more than 16,000 Customer Support professionals.

All of which, we suggest, makes Solaris not only the language of good business computing, but the language of good business sense as well. 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

TOUGH TIMES *in the auto industry make IS groups more conservative*

CHALLENGES

- Platform integration
- Networking

KEY TECHNOLOGIES

NOW

- LAN applications
- Networks
- Order and supply-chain applications

NEXT FIVE YEARS

- Distributed RDBMSs
- CIM
- EDI

1

Dresser Industries, Inc.

Continued from page 21

The fourth-largest industrial and farm equipment supplier, Dresser saw its sales rise 4% in 1991, to $4.7 billion. The role of information systems is to provide tools that allow each of Dresser's 20 autonomous divisions to bring in money faster.

Toward this end, the IS group offers EDI as a mainframe service across the entire organization. Currently, departments use it for requests for proposals, customer purchase orders and acknowledgments, confirmed ship dates and purchase orders. "We've eliminated the two-week lead time while the paper was being moved," Paulsen says.

He adds that there is a generalized pressure from internal customers for better processing capability, and the biggest challenge is trying to meet those expectations at lower cost. In 1991, total IS spending was down 10% to $108 million, and he looks for another 10% decline in 1992.

2

Black & Decker Corp.

Rapid response is the magic phrase at Black & Decker. The power tool and appliance manufacturer, which offers 5,000 product lines, is investing in new just-in-time systems and software to speed deliveries.

EDI is a major piece of that plan, says Donald Lee, acting manager of worldwide information services. In the U.S., the firm is implementing EDI between Black & Decker and its customers, while in Europe, it focuses on computerized links between the manufacturer and supplier base.

The allocation of Black & Decker's $80 million 1991 IS budget reflects the new priorities. Although that figure was down 10% from the previous year, the company chose to buy quick response and MRP II applications and make up the difference by reducing expenditures on the operational side (maintenance and support).

3

Caterpillar, Inc.

Caterpillar's 1990 reorganization into 14 profit centers and declining sales and earnings (it lost $400 million in 1991 on sales of $10.1 billion) have resulted in an IS department rebuilt for speed.

Major systems programs now in the works include an effort to link the various engineering groups to shorten the product design cycle and widespread EDI implementation to hasten just-in-time delivery. The company expects to bring 80% of its supplier base onto the system within 18 months.

"Time is money, and in this economy it's critically important that IS find the cheapest ways to bring products to market faster," says Robert Roof, business manager of corporate information services.

IS is cutting back its support spending. "Support currently runs about 60%" of the centralized IS budget, Roof says. "I think our customers can get by with less hand-holding. We can crank down support spending 5% or 10%."

4

Harley-Davidson, Inc.

Don't talk recession to this manufacturer of motorcycles, recreational vehicles, parts and motorcycle fashion accessories. Demand began soaring late last year — fourth-quarter earnings rose 86% on a 22% jump in sales — and hasn't let up. IS director Richard Kolbe credits improvements in product quality, noting that the overall U.S. motorcycle market is relatively flat.

For Kolbe and his staff, this mini-boom presents an enviable problem: speeding up deliveries to satisfy the pent-up demand of dealers still on allocation.

To accomplish this, Harley has invested in tools such as a commercial inventory planning and forecasting system for use in the repair parts and accessories business.

5

Eaton Corp.

As an OEM component supplier to two recession-blasted industries — auto manufacturing and construction — Eaton is under increasing cost pressure from its customers.

These pressures have prompted the company to accelerate its expansion into

PHOTOGRAPHY BY ANDY SACKS/TONY STONE WORLDWIDE

overseas markets via a bevy of small acquisitions. And IS has come through with new cost accounting systems aimed at ensuring consistency of reporting among far-flung manufacturing enterprises. "We're now making the same product in two or three different countries, and it's critical that we get a handle on what it's costing us," says Derek Mumford, newly named vice president of information technologies.

Recent investments in manufacturing control systems such as IBM's Copics also support the goal of controlling costs on a worldwide basis, Mumford says.

6

Ford Motor Co.

Among the Big Three, Ford has experienced the biggest rebound. The company earned $337.9 million in the first quarter of this year — a major comeback after last year's $884 million loss.

But nobody at this $88 billion automaker is crowing about a recovery, least of all in the 5,000-member decentralized IS operation, where spending currently runs below 1.5% of revenue and advanced technology has been placed on the back burner.

Cnossen says IS remains in a period of relative "introspection," trying to pinpoint those areas where its strengths can be aligned with corporate goals.

Most recently, IS has turned its attention to the plant floor, developing a suite of applications that allows production people to monitor and control work in progress.

7

Deere & Co.

By the time the recession hit Deere's agricultural and construction equipment businesses full force, IS was already fortified against the impact. Major investments in manufacturing resource planning, engineering and commercial systems over a 10-year period had improved efficiency. And Deere had recently wrapped up a worldwide networking project to integrate its mainframe and engineering workstations via Ethernet. "Now all of our plants have access to the same data," says R. D. Sonnenburg, director of computer IS.

Thus, Deere, which forecasts $202 million in IS spending this year, felt comfortable last February in turning down a proposal to outsource its data processing and worldwide communications to IBM.

"We've done a lot of competitive benchmarking," Sonnenburg says, "and we believe we are doing it cheaper."

DEFINING REALITIES

BUDGETS

Roughly half of these companies experienced a decrease in IS budgets last year. This trend is expected to be repeated in the coming year.

PRESSURES

IS departments in these industries are being asked to trim their own costs and supply systems that will reduce operating time and costs to market.

ORGANIZATIONAL CHANGES

Three quarters of these companies plan to merge or consolidate their operations by 1993. About half of the companies already have centralized operations. The remaining companies have both centralized and decentralized operations.

PLATFORM CHANGES

Well over three quarters of these companies say they plan to install proprietary systems within the next year.

8

Paccar, Inc.

At Paccar, the recession drove home the need to diversify. More than 80% of the corporation's business hinges on diesel truck sales, which tend to be cyclical.

IS general manager Bruce Carlson says his 360-member department is doing its part to further the company's diversification efforts, which have brought it into new areas such as after-market truck parts retailing, financial and leasing services.

Carlson says the department's $10 million in capital spending on software focuses largely on automation of the retail operation. Paccar has invested in EDI to improve order processing in both the retail and the mainstream truck businesses, and investments are being made in retail point-of-sale systems and electronic catalogs. Efforts are also under way in the computer-aided design, manufacturing and engineering areas.

9

Trinity Industries, Inc.

What's the good news about being the manufacturer of a product that has had soft sales for two years? Well, if you make a really big-ticket item such as railcars and orders have been off for that long, about the best you can hope for is a unique selling advantage so that you can capture a healthy share of whatever business there is. That's what Trinity Industries has managed to achieve. With some help from IS, the company has made itself into the market's lowest cost producer, with 50% of the industry's productive capacity.

Analysts expect demand to begin rebounding in the coming months as older rail cars are scrapped at accelerating rates — but better times ahead are not likely to cause the IS group to start spending wildly on new systems. This department has long hewed to a "conservative" systems philosophy that emphasizes financial discipline over leading-edge technology. There is probably a lot more mileage in those IBM Application System/400s.

10

Ingersoll-Rand Co.

After two lean years, this $3.6 billion maker of ball bearings, air compressors and other heavy equipment is cutting back on just about everything, including its 600-member IS group. George Tabback, director of corporate IS, says spending, which equaled 1.7% of revenue last year, is expected to fall as a percentage of the top line.

But Tabback still has ambitious projects on his plate, such as installing virtual networks to support Ingersoll-Rand's European expansion and implementing Pansophic's BPCS to help integrate manufacturing, distribution and financial functions.

Tabback says moving from the mainframe to the AS/400 and more packaged software could bring a big savings. In the UK, he says, 50 people supporting a mainframe have been replaced by 24 people supporting three AS/400s.

Mehler is a free-lance writer based in Jackson Heights, N.Y.

Breaking the mold

Companies concentrate on strengthening the customer link

▶BY EMILY LEINFUSS

Manufacturers in the U.S. can't afford to be complacent: Worldwide recession is causing many customers to sit on their hands, and fierce competition has made raising quality an imperative and raising prices a near impossibility.

In many cases, small, incremental changes just aren't enough to move buyers or hold off the competition. Whole processes have to be reworked to gain new efficiencies. The supply chain has to be shortened and streamlined. Inventories have to be lowered, rework reduced and costs brought under control. Basically, the whole production structure must be reshaped. All of this requires aggressive and innovative use of information systems.

This will not be an easy job because U.S. manufacturing's worst enemy is often its own internal rigidity, according to Martin Ressinger, an analyst at Duff & Phelps, Inc. in Chicago. "Internal struggles based on old lines of power keep these companies from making obvious structural and cooperative changes," Ressinger says.

At leading-edge manufacturing companies where changes are being made, IS organizations are providing not only technology expertise but also assistance with process reform.

The *Premier 100* companies are also asking their IS organizations for the means to forge strategic partnerships with key customers. At Cone Mills Corp., for example, IS works hand-in-hand with the retail apparel industry to develop standards for quick-response, real-time linkage.

Customer satisfaction has become almost a religion at all of these companies. Providing customers with links into their systems is a priority at most of the Top 10 manufacturing firms because it allows a faster, easier response to customer needs and stengthens the ties that bind them.

Profitability now depends heavily on operating margins. For that reason, much attention is being paid to linking operations with business systems to provide a consistent set of numbers for everything from marketing analysis to automated inventory control. A case in point is Eastman Kodak Co., which has made integration its No. 1 concern.

Now, management is demanding cost accountability and maximum investment effectiveness. IS is responding to this trend by benchmarking best practices within the industry and focusing on improving quality. Cost control measures include eliminating non-value-added expenses.

Globalization is also an area of concern for IS groups in manufacturing. For example, industry leader Kimberly-Clark Corp. is spending $5 million to $7 million to redesign its telecommunications infrastructure to enhance point-to-point communications among customers, manufacturing and distribution sites.

INDUSTRY LEADERS

1. **D. James Dull**
   V.P., MIS
   Kimberly-Clark Corp.
2. **Harvey R. Shrednick**
   V.P., IS
   Corning, Inc.
3. **Carl A. Kuhrmeyer**
   V.P., Administration
   3M Co.
4. **H. William Howard**
   CIO
   Inland Steel Industries, Inc.
5. **Paul Vetter**
   Director, IS
   Cone Mills Corp.
6. **James A. Stutts**
   V.P. (Fieldcrest Cannon)
   Amoskeag Co.
7. **Candy Obourn**
   Director, IS
   Eastman Kodak Co.
8. **Bernie Campbell**
   V.P., IS
   Sonoco Products Co.
9. **A. L. Hyland**
   Director, Worldwide Systems
   Polaroid Corp.
10. **Walter N. Bargeron**
    V.P.
    Bethlehem Steel Corp.

1

Kimberly-Clark Corp.

Faced with maturing U.S. markets, fierce challenges in its major product lines and growing European competition, Kimberly-Clark is using technology to gain an edge. Key objectives include reducing order cycle time, improving customer service and generating customer-specific data for targeted marketing and merchandising. Working closely with Chief Executive Officer Wayne Sanders,

KIMBERLY-CLARK'S SANDERS *uses IS to cut order cycle time, improve customer service, guide marketing efforts*

former Chief Information Officer John T. Kohler used IS to speed electronic ordering across the board. His initiatives punched up domestic order processing and inventory control.

Kohler left the Neenah, Wis.-based paper and fiber products innovator in July to start a consultancy.

Next year, under the direction of new CIO D. James Dull, there will be a major emphasis on communications. The redesign of the firm's telecommunications infrastructure reflects the global nature of its business.

2

Corning, Inc.

Harvey Shrednick, Corning's vice president of IS, is charged with making quality improvement at the diversified manufacturer a reality. The company is banking on total quality management as its first and most powerful weapon against the competition. The Corning, N.Y.-based company, makes aggressive use of technology to track and analyze its quality programs.

Another initiative is revamping internal systems to boost office productivity and team effectiveness.

3

3M Co.

The IS strategy of 3M Co., a diverse global manufacturer, centers on the power of the personal computer at home, the economics of centralization abroad and electronic data interchange (EDI) worldwide. This year the St. Paul, Minn.-based office equipment and supplies company pursued distributed computing with a vengeance, configuring PCs and servers to connect directly to mainframes and cutting out the midrange processor.

This shift gives more capability to end users and brings computer power closer to the action. Improvements in telecommunications in Europe and the European Economic Community movement spurred 3M to plan consolidation of its 18 computer centers into five during the next few years.

CHALLENGES

- Process improvement
- Order management applications
- Retailing application development

KEY TECHNOLOGIES

NOW

- EDI
- On-line customer service
- Product scheduling

NEXT FIVE YEARS

- EDI
- CIM

4

Inland Steel Industries, Inc.

Competition from overseas manufacturers and domestic mini-mills has forced Inland Steel in East Chicago, Ind., to tighten its belt. For IS, this means emphasizing improved use of existing technology. Recently, IS staffers took a look at how departments actually used reports, eliminating some and tailoring the useful

PHOTOGRAPHY BY REID HORN

ones to the particular requirements of each set of users.

Inland Steel is also developing a long-term architecture based on smaller and more open systems, operating in a client/server mode. This puts more power in users' hands.

5

Cone Mills Corp.

Cone Mills, based in Greensboro, S.C., is on the verge of a public stock offering and in the middle of a market expansion. Because the textile supplier to the retail apparel industry is growing faster internationally than domestically, it is looking at videoteleconferencing techniques and high-speed networks that will connect it more effectively with Europe.

During the past year, Paul Vetter, director of information services, initiated a drive to move all key internal systems to real-time through re-engineering and the use of high-speed networks.

Heavily committed to EDI, the textile and apparel industries are working together to develop standards for nomenclature at a technical level.

6

Amoskeag Co.

Boston-based Amoskeag's major IS investment lies in its largest holding, Fieldcrest Cannon, Inc., the country's sixth largest textile manufacturer. Other holdings include real estate and a Maine railway, Bangor and Aroostook Railroad, which services paper companies.

Fieldcrest claims a 50% share of the U.S. towel market and 20% of the sheet market. The company's IS initiatives have included helping to incorporate a series of rapid expansions and acquisitions over the past decade, as well as embarking on major plant modernization programs.

Buffeted by the recession and overseas competition, Fieldcrest is trying to reduce debt and cut operating expenses, laying off 1,100 workers last year.

In 1988, the company formed three divisions with separate corporate managements and sales forces for faster response to customer needs, but they continued to share manufacturing facilities. Towel-making plants are being upgraded in a five-year, $250 million modernization project to increase efficiency. Analysts say that if Fieldcrest can slim down its debt and expenses, it will be well-positioned to be strong when the recession lifts, and efficient IS operations will be a key component of that strength.

DEFINING REALITIES

BUDGETS
Less than half of these companies expect their budgets to change by 5% or more in 1993.

PRESSURES
Producing a continuous stream of new products. Rapid technological growth.

ORGANIZATIONAL CHANGES
Most companies have a mix of both centralized and decentralized operations.

PLATFORM CHANGES
A large majority of companies plan to install nonproprietary systems in the next year.
Less than half plan to downsize from larger platforms to smaller ones.

7

Eastman Kodak Co.

New IS chief Candy Obourn's title says it all. As vice president of IS and business processes, Obourn has set out — with the help of Kodak's outsourcing partner, IBM's Integrated Systems Solutions Corp. — to transition the Rochester, N.Y.-based company's core businesses to client/server computing and re-engineer business processes along the way.

After two successful pilots, Kodak recently began full-scale implementation of a software system that integrates order processing with manufacturing, financial distribution and operations.

The main business objectives include reducing cycle time and errors in manufacturing and order processing and providing a more comprehesive view of current financial and operations conditions for decision-making and planning. Re-engineering the core businesses will take five to 10 years.

The company has also reduced its infrastructure cost and number of IS workers by about 10% during the past year through early retirement.

8

Sonoco Products Co.

As Sonoco shifts from a large, domestic paper packaging manufacturer to a global supplier, IS management at the Hartsville, S.C., firm is devising a consistent IS architecture that will not only cross cultures but also permit the merging of administrative, product, marketing and logistical data from many locations. The systems environment, which will have to cope with more product variety and shorter product lifetimes, will likely be based on a mixture of Digital Equipment Corp. VAXs and IBM Application System/400s and PCs.

Bernie Campbell, vice president of corporate information services, considers those changes just a starting point. "Once you have core systems, then you can look at creative ways of using the information."

9

Polaroid Corp.

Integration is the operative word at Polaroid. The photographics products company, based in Waltham, Mass., is beset by intense global and domestic competition. IS' response is to increase decision support capability while reducing overall costs.

Polaroid's director of worldwide systems, A. L. Hyland, is moving applications to common platforms and operating systems. Key technologies include relational database management systems, such as IBM's DB2 and The Ask Cos.' Ingres, local-area networks and Unix.

10

Bethlehem Steel Corp.

In an industry in which none of the major manufacturers are running at more than 75% to 85% capacity, you have to be efficient. Bethlehem Steel in Bethlehem, Pa., is determined to be efficient. It is using IS to manage inventory levels and production for maximum profitability.

This charge is led on four fronts: better data management, enhanced connectivity, more "user-friendly" software and better software integration. ■

Leinfuss is a free-lance writer based in Sarasota, Fla.

Down to fighting weight

Less is more as leading users battle recession

▶ BY CHERYL GOLDBERG

INDUSTRY LEADERS

1. **Charles Bowerman**
   Executive V.P. and CIO
   Phillips Petroleum Co.
2. **Donald S. Pirkle**
   V.P., Corporate IS
   The Dow Chemical Co.
3. **Dan Irwin**
   V.P., Technology, Manufacturing, IS
   FMC Corp.
4. **Paul R. Jones III**
   Director, Corporate IS
   Unocal Corp.
5. **George-Anna Bobo**
   Manager, Corporate Information Resources
   Union Texas Petroleum Holdings, Inc.
6. **Leonard A. Cohn**
   V.P., Corporate MIS
   Monsanto Co.
7. **Gaige R. Paulsen**
   CIO
   Ashland Oil, Inc.
8. **David A. Stitely**
   CIO
   Rohm and Haas Co.
9. **Ken Rohan**
   Vice President, IS
   NERCO, Inc.
10. **Peter W. C. Mather**
    V.P., IS
    Air Products and Chemicals, Inc.

KEY TECHNOLOGIES

NOW
- Seismic processing
- LAN operations

NEXT FIVE YEARS
- Client/server systems
- LANs
- RAID storage

PHILLIPS PETROLEUM'S *IS manager Jim Gottardi moves IS closer to users*

Rightsizing, recession and recovery are the main challenges to the petroleum and chemicals industries. Information systems teams face a daunting task: adapt technology to make their firms more cost-effective in the face of dismal business conditions. Although a gradual economic recovery is expected to help pull the chemicals industry out of the doldrums, petroleum companies have been pummeled by falling demand, high exploration costs and low prices, and they may not see a turnaround for some time.

Both industries see the strategic advantages of implementing information technologies. However, the petroleum industry cut IS budgets by an average of 2.2% in 1992, and chemical companies increased theirs by a scant 0.8%, according to a recent survey by CSC Index, Inc. in Cambridge, Mass.

IS efforts to make order fulfillment, manufacturing and distribution systems more effective are part of an overall plan in many companies to create a system that manages the flow of materials from the time an order is placed to when it is shipped to achieve 100% on-time delivery to customers. Refineries are also looking at ways to integrate manufacturing functions.

Where possible, companies are moving applications from mainframes to lower cost minicomputer- and personal computer-based local-area network platforms and are giving control of the systems to individual business units. This trend is allowing business units to explore decentralized decision-making. The decentralization trend is key for the No. 1 company in this category, Phillips Petroleum Co. The firm's mandate is to

PHOTOGRAPHY BY ALAN LEVENSON

DEFINING REALITIES

BUDGETS
Cutbacks have been common. In many instances, budget reductions exceeded 10%.

PRESSURES
Companies will make greater use of systems integrators to control costs. Fifty-six percent of the top companies surveyed said they would increase this service, more than any other industry category.

ORGANIZATIONAL CHANGES
Data center consolidation is rife in this industry. In fact, this industry had the highest percentage of consolidations last year.

PLATFORM CHANGES
Many companies are planning on downsizing, citing system effectiveness as a primary concern. More than half are sticking with proprietary systems.

CHALLENGES

- Integration of CASE technology
- Managing more work with same resources

decrease its budget and distribute part of its programming staff from a centralized mainframe environment to decentralized business unit teams. The move was designed to allow users greater control and access to system resources.

1

Phillips Petroleum Co.

Celebrating its 75th anniversary this year, Phillips Petroleum is the ninth-largest integrated petroleum company in the U.S. Hard hit by the recession and the fall of oil and gas prices, the Bartlesville, Okla., company has trimmed its 22,700-person work force by 1,200 and has reduced its overall capital budget by about 16% from 1991. IS has not been spared: Its budget took a 20% hit, dropping to $183 million.

Faced with these challenges, the IS organization is moving technology closer to users. Some of the IS work load and programming staff will be moved from IBM 3090 mainframes to IBM RISC System/6000s and Sun Microsystems, Inc. SPARCstations. The move, currently for software development and scientific applications, will save mainframe cycles and help the company defer future mainframe upgrades.

Because programmers won't have to wait for the mainframe and can use workstation-based development tools, Phillips expects the move to improve programmer productivity.

2

The Dow Chemical Co.

As a commodity chemical company, Dow in Midland, Mich., has been hit particularly hard by the recession. Cost cutting, therefore, is the order of the day in IS.

During the past five years, Dow has been working to make IS more efficient by integrating systems across the entire company. For example, it has linked all applications relating to the order life cycle — from the original order entry to production to distribution — into a companywide financial management system.

The system lets Dow provide real-time information to customers about the status of a product they have ordered or are thinking about ordering, no matter where it is in the process.

3

FMC Corp.

Mixing technology savvy with a business diversification strategy, Chicago-based FMC was one of the few chemical companies to post gains during the past year. Net income rose 18% between the first quarters of 1991 and 1992.

Nonetheless, FMC is continually looking at ways to reduce costs. The company has trimmed the number of IS workers by about 10% during the past few years by automating and consolidating operations.

To save utility costs and improve data accessibility, FMC is implementing a private telecommunications network in Europe, which is an extension of its U.S.-based wide-area network.

4

Unocal Corp.

Returning to its core businesses has caused Los Angeles-based Unocal's IS organization to downsize its systems to save $9 million this year and make applications more accessible.

A sell-off of divisions has prompted Unocal to consolidate three data centers into one by the spring of next year. Between 1990 and 1992, IS staff will be cut 20%, with many of the remaining workers organized into cross-functional teams. Such a team may include people on the help desk, who handle a variety of areas such as network management, mainframe operations and PCs.

To help geophysicists obtain better access to seismic information for exploration, Unocal is migrating the applications on its IBM Enterprise System/9000 Model 820 to a Convex Computer Corp. 3840 minicomputer connected to 100 Sun SPARCstations.

Other initiatives include consolidating the management of the company's WANs and using multimedia to develop just-in-time training systems to provide workers with timely, relevant information.

5

Union Texas Petroleum Holdings, Inc.

Union Texas Petroleum's IS organization has maintained a high level of effective service despite an earthshaking downsizing effort that has seen the company sell off three of its major U.S. operations to concentrate on international exploration.

The work force at the Houston-based company has been cut by a drastic 65%. Not surprisingly, IS saw its budget slashed from $12 million to $6 million between 1991 and 1992, with another $2 million in cuts expected next year. The IS staff has been cut by 60%.

The secret to maintaining strong IS services in this environment, says corporate IS manager George Anna Bobo, is a combination of outsourcing and placing more services under the control of users.

For example, payroll functions have been outsourced, and IS plans to replace its IBM 3090 with a Digital Equipment Corp. VAX 4000/500 early next year.

The company is also migrating some systems, such as human resources and international accounting, to PC LANs. Data access for ad hoc reporting has been shifted from the IS group to individual departments, which cuts the need for IS support in half.

6

Monsanto Co.

Unlike many of its *Premier 100* peers, Monsanto's IS organization has the luxury of doing more with more. The chemical group at the St. Louis-based company saw its operating income increase 5% in the first quarter, which allowed the IS budget to swell by 10% this year.

Monsanto's technology investments are aimed at improving such global decisions as determining which plant is best for manufacturing a particular product or where in the world to obtain the most favorable interest rates.

Monsanto is also devising a list of corporatewide standards of preferred vendors, software packages and operating systems. Implementing these standards will help Monsanto get better pricing through volume purchases and minimize training costs.

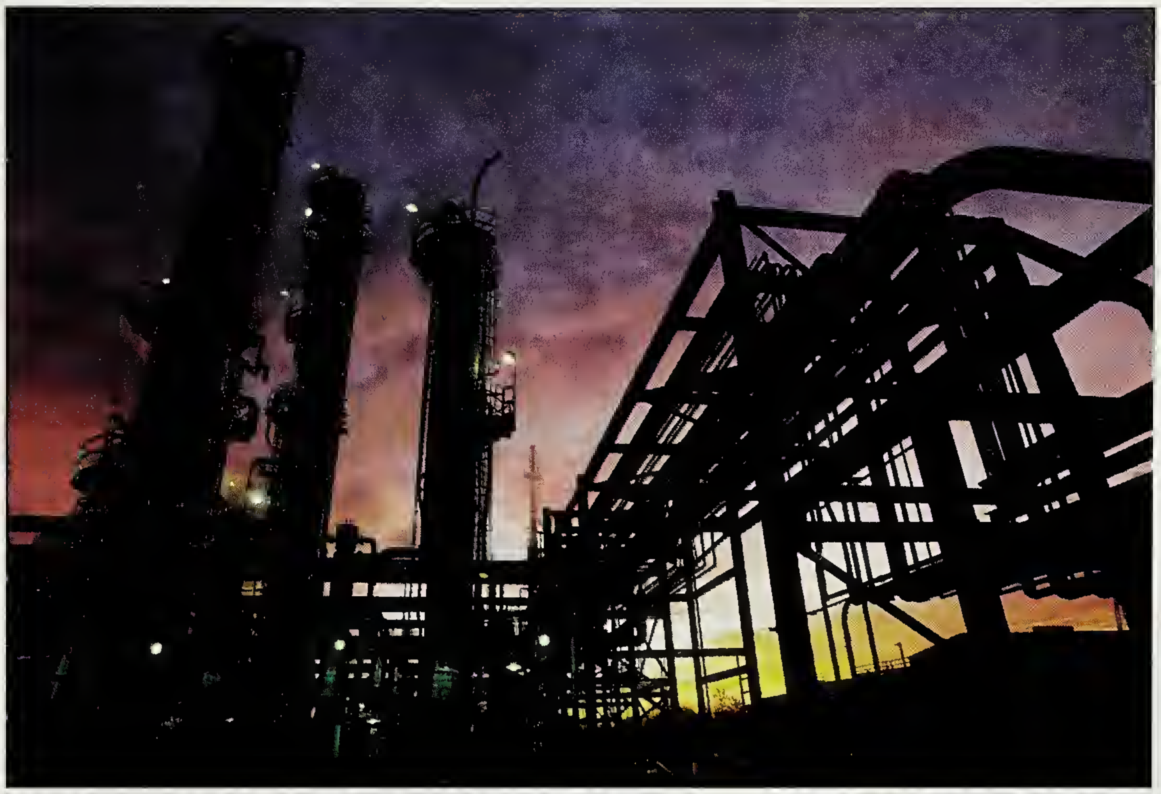
7

Ashland Oil, Inc.

After selling a number of subsidiaries that didn't fit its mix, Ashland Oil in Russell, Ky., is beefing up its areas of strength — chemicals, Valvoline automotive products and SuperAmerica convenience store divisions. During the past year, Ashland acquired Unocal's chemical business, and Ashland's Scurlock crude oil division acquired Permian Corp.

Ashland's IS organization is charged with quickly integrating the new acquisitions into the fold. A major task of this effort is to incorporate them into the shared corporate data center that provides telecommunications and mainframe resources for all divisions.

In addition to this strong central approach, the divisions each pursue respective rightsizing efforts, moving as much software development as possible off the mainframe to a PC platform. Such rightsizing may involve moving to PC LANs as well or to IBM Application System/400s connected to the central mainframe for client/server computing.



CHEMICAL AND PETROLEUM FIRMS *focus on improving efficiency of production*

8

Rohm and Haas Co.

Philadelphia-based Rohm and Haas has responded to the lows in the chemical industry by getting down to basics: customer service.

Although the company's diversified specialty chemicals business — plastics, agricultural chemicals, polymers and resins — produced earnings of $59 million for the first quarter of 1992, up from $41 million for the same quarter last year, the company wants to do better by providing customers with 100% on-time delivery.

This is the goal of a $10 million materials management system that will integrate order processing, materials management and manufacturing for the company on a worldwide basis. The materials management program, STSC, Inc.'s Logistics Plus, will help Rohm and Haas forecast demand to determine the materials needed to meet production schedules.

9

NERCO, Inc.

NERCO suffered a first-quarter loss of $178 million because of an 18% nosedive of natural gas prices in February (the lowest level in 12 years) and wants to cut costs wherever possible.

That includes plans to replumb and consolidate its computer operations. The idea is to invest now to lower per-unit production costs for a leaner and meaner future. The company's new architecture is based on an open systems environment, with DOS and Microsoft Corp. Windows-based PCs linked via Novell, Inc. LANs, which are tied to Unix-based Sequent Computer Systems, Inc. S2000s and Sun SPARCstations and servers.

On this platform, NERCO is consolidating the accounting applications for its three divisions — oil, gas and minerals — under Oracle Corp.'s financial software running on a server.

10

Air Products and Chemicals, Inc.

Air Products and Chemicals' emphasis on specialty chemicals, which suffered less during the recession, combined with the company's gas contracts, which are longer term "take or pay" agreements unaffected by quarterly demand cycles, helped the company stay competitive and post a modest 2% first-quarter profit.

The Allentown, Pa., firm's widely respected IS organization is redistributing many of its centralized resources to three main business units.

Goldberg is a free-lance writer based in San Francisco.

PHOTOGRAPHY BY BOB THOMASON/TONY STONE WORLDWIDE

US WEST Communications

Network Operations Center
Always running
Always open
Always reliable
Sun Service and Support.

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCstation is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

The technicians of US WEST's Network Operations Center of Colorado know the price of a switch failure: Police, fire, rescue, hospital – all would be out of communication.

The challenge: To guard, maintain and surveil the switches which give the reassuring dial tone to the entire 14-state US WEST territory.

Their partner: Sun Microsystems® and Sun™ Worldwide Customer Support, providing 24-hour hardware, software, and network protection.

Their common creation: A powerful system of Sun SPARCservers™ linked with Sun SPARCstations™ that let each technician monitor several switches right from the desktop.

The installation, configuration, and customization of the front-end interface? All handled by Sun. And all right on schedule.

Coming soon: Hundreds more Sun SPARCstations and Sun SPARCservers. In Network Operations Centers in 14 western states for 25 million US WEST customers.

With a dial tone for every one. To learn more, call 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Pharmaceuticals and Food

Spending for the future

Companies take advantage of a buyers' market

▶ BY DANIEL LYONS

Recession or no, pharmaceuticals and food companies have continued to invest heavily in information technology in 1992. On average, drug companies will spend 7.3% more on technology this year than last — more than double the 3.5% average gain for all industries, according to CSC Index, Inc.

By increasing spending during the recession, drug companies have been buying technology and consulting services at lower costs, positioning themselves for a competitive advantage when the recession ends, says Michael Hawotte, a director at A. T. Kearney, Inc.

Drug companies are hot for technologies such as videoconferencing to save on travel and imaging to speed document processing time. There's one overriding goal behind almost all investments, however, and that is this: Compress the product cycle, says Peter Kirn, managing partner of the pharmaceuticals industry practice at Andersen Consulting in Chicago. "On average, it takes 12 years and $250 million to bring a drug to market," he says.

On the manufacturing side, pharmaceuticals companies are looking to improve yields by raising quality or volume — or both. "I had a client tell me once that if he could raise the yield on a product by 0.5% it was worth $10 million a year to him," Hawotte says. The ultimate, but still hypothetical, manufacturing environment is a "lights-out" operation.

As for marketing, pharmaceuticals companies are launching more joint ventures with one another, requiring better coordination of sales force automation programs and customer service streamlining.

Increased efficiency is also the name of the game in the food industry, chiefly on the marketing and distribution side of the business.

By developing tight electronic data interchange (EDI) links with grocery stores, for example, food manufacturers can provide just-in-time shipments to outlets, thereby reducing inventory and shipping costs. Still, storefronts have been slow to adopt EDI technology.

That's mostly because distributors and resellers still see EDI as a one-way street: It helps manufacturers, but the benefits to consumers and retailers have not been shown. "Technology can monitor what is actually happening in a store vs. what we think is happening. Down the road, it may even tell us what consumers want," says Glenn Terbeek, managing partner of the food and packaged goods industry program at Andersen Consulting.

1

Merck & Co.

Perhaps the biggest computer-related event at Merck in the past 12 months was the Nov. 1, 1991, appointment of Charles Popper, a former partner at Deloitte & Touche, to run Merck's worldwide computer operation.

The challenge, as Popper sees it, is to find ways to deliver products more efficiently. "We're facing fundamental changes in the marketplace in

INDUSTRY LEADERS

1. **Charles Popper**
   V.P., Computer Resources
   Merck & Co.
2. **Robert Lyons**
   V.P., Corporate IS
   Schering-Plough Corp.
3. **Roland Cyr**
   V.P., Information Technology
   Becton, Dickinson & Co.
4. **Vincent H. Swoyer**
   V.P., Corporate Systems
   Sara Lee Corp.
5. **Lyle T. Bosacker**
   Director, Corporate IS
   International Multifoods Corp.
6. **Allan B. Deering**
   VP, MIS
   Pepsico, Inc.
7. **Alex Gibbons**
   Corporate Director, IS
   Bristol-Myers Squibb Co.
8. **Jack R. Longman**
   V.P., Information Resource Management
   Upjohn Co.
9. **Kenneth Farmer**
   V.P., MIS and Administration
   Abbott Laboratories
10. **Ron Morris**
    CIO
    Johnson & Johnson

CHALLENGES

- Networking
- Decentralization
- Quality improvement

KEY TECHNOLOGIES

NOW
- EDI
- Telecommunications
- Shipment and tracking systems

NEXT FIVE YEARS
- Client/server systems
- RAID storage
- EDI
- Groupware

CHARLES POPPER: *'We're facing fundamental changes in the marketplace'*

terms of price pressure, demands for better service and finding ways to deliver our products more efficiently," he says.

Merck, an $8.6 billion pharmaceuticals giant, placed No. 1 in last year's *Premier 100*, too. The company will spend $230 million on information technology this year. Major outlays include the recent acquisition of a Cray Research, Inc. YMP supercomputer to replace an IBM 3090 for computational chemistry.

The supercomputer will add "substantially more capacity to use molecular modeling techniques in support of research," Popper says.

Merck is redesigning its clinical research program and re-engineering its worldwide networks to reduce the time it takes to bring products to market. Merck continues to automate its manufacturing plants to improve yields. "We're moving toward computer-integrated manufacturing. We have automation in a number of plants," Popper says, "but it's a multiyear effort to get to a more complete level."

2

Schering-Plough Corp.

Schering-Plough jumped from eighth place in last year's *Premier 100* to second place this year. The Madison, N.J., company has increased its focus on developing applications for sales and marketing, including new local-area network-based systems and sales force automation programs that should improve its relations with customers.

In an effort to contain costs, the $3.6 billion company has not increased its IS staff this year. Shering-Plough's IS budget will be $67 million this year, a gain of about 10%. The company makes pharmaceutical and consumer health care products.

3

Becton, Dickinson & Co.

Globalization is the mobilizing trend at Becton, Dickinson this year. The $2.2 billion company is rolling out a set of common applications — such as order management, sales, financial reporting and accounting — on a worldwide basis, using frame-relay technology for data communication.

The idea is to improve the consistency of data across the organization. "Our key objective is to be able to communicate, consolidate and provide easy access to information on a worldwide basis," says Roland Cyr, vice president of information technology.

The Franklin Lakes, N.J., company is also expanding its global communications network, installing videoconferencing facilities at 13 sites, with plans to add five more. This is crucial technology because the company is flattening its structure and building teams to manage each of its 11 major product lines. Team members may be from sales, marketing and research staffs in centers all over the world.

Later this year, the company will roll out a worldwide human resources database. The IS budget is $58 million, up 16% from $50 million last year.

4

Sara Lee Corp.

Less is more, according to the IS recipe at Sara Lee, which is migrating from mainframes to microcomputers.

"Our intent is to exploit the capability of the micro," says Vincent Swoyer, vice president of corporate systems. "We're already using it in mission-critical applications."

Only one mainframe application survives in the corporate offices from five years ago. Everything else — all tax work and financial consolidation, for example — is done on personal computers.

Manufacturing work has already shifted from mainframes to Digital Equipment Corp. and IBM minicomputers; Swoyer says that eventually those applications will migrate to microcomputers again.

The Chicago-based company has more than 3,000 IS people worldwide. Many are being retrained in

PHOTOGRAPHY BY DAVID ZICKL

client/server technology.

The company's IS budget this year will be $138 million, of which 45% will be spent on the IS department's 1,400 staff members. About 4.5% of the budget will go toward training. The company has 108,000 employees and 30,000 PCs.

5

International Multifoods Corp.

Based in Minneapolis, International Multifoods is a $2.2 billion food processing company. This year's IS budget is $11 million, of which $4 million will be spent on the company's 140 IS staff members, and $100,000 will go toward training users.

International Multifoods has 1,500 PCs and $4 million worth of major processors.

6

Pepsico, Inc.

Ray Charles isn't the only one singing the praises of Pepsi. Ranked 10th in its industry in the *Premier 100* last year, Pepsico, based in Purchase, N.Y., leapt to the No. 6 spot in 1992. Uh-huh.

To improve productivity, Pepsico's top brass has emphasized "empowering" its employees this year. And though the company is pushing more responsibility out into the field, it is also pushing technology.

In March, the $5.9 billion company made a substantial minority investment in a Denver company, Carts of Colorado, Inc., which has developed a "smart" vending cart that can relay sales information via telecommunications and computing equipment to a central location.

Pepsico will deploy the carts at schools, ballparks and shopping malls, stocked with food from its Taco Bell restaurant chain. The company is also outfitting its Canadian truck drivers with handheld computers to relay sales data. The program began in the U.S. several years ago.

7

Bristol-Myers Squibb Co.

The beat goes on at Bristol-Myers Squibb, thanks in part to Pravachol, a drug that fights heart disease. Pravachol, which won FDA approval last fall, is expected to be a blockbuster that will buoy profits at Bristol-Myers Squibb for the next few years.

DEFINING REALITIES

BUDGETS

Half of the IS departments in this group had more money to spend last year, and half expect an increase next year.

PRESSURES

More than two-thirds of the leading companies reported they will consider outsourcing all or part of their IS operations in the coming year.

ORGANIZATIONAL CHANGES

More than half of these companies plan to merge or consolidate a data center in the coming year.

PLATFORM CHANGES

Changes have been minimal. This industry remains a bastion of large systems.

In response to pressure from customers, Bristol-Myers Squibb this year said it would cut the prices it charges federal health programs by at least 12.5%. The company will try to make up the difference by raising consumer prices and increasing volume sales to federal agencies. Efficiency gains through technology will play a vital role in this plan, says Alex Gibbons, corporate director of information services.

The total IS budget in 1992 is $209 million. With sales of $11.3 billion, the New York-based firm is, after Merck, the second largest pharmaceuticals firm in the U.S.

8

Upjohn Co.

Upjohn, based in Kalamazoo, Mich., is trying an experimental marriage of marketing and IS. Last year, the company moved Ralph Feldt, an executive in worldwide marketing, into IS, with two goals: to teach IS staff members ways to market themselves internally and to help business managers learn to use IS services.

The move comes at a critical juncture for Upjohn. The $3.4 billion pharmaceuticals giant faces patent expirations on several key drugs, as well as problems with Halcion, its sleep medication.

Some say the drug has dangerous side effects; Upjohn insists that Halcion is safe. So far, the FDA agrees with Upjohn.

9

Abbott Laboratories

In June, six months after winning FDA approval for temafloxacin, a key new antibiotic, Abbott withdrew the product because of adverse reactions among patients.

But the Abbott Park, Ill., pharmaceuticals leader probably won't even break stride. The company posted record sales of $6.9 billion in 1991 and is considered strong because of the diversity of its product lineup, which includes Selsun Blue shampoo and Similac infant formula.

Ranked among the Top 10 in its industry for the past four years, Abbott's IS strategy includes investments in an automated purchasing network and the sale of its own health care planning and marketing software.

10

Johnson & Johnson

Decentralization is no mere technological Band-Aid at Johnson & Johnson. It is at the heart of the company's culture. As new products are created, a new operating unit is dedicated to producing and marketing them. The role of IS in this environment is to support the efforts of the business units and keep centralized functions to a minimum.

The pharmaceuticals and consumer products company, based in New Brunswick, N.J., posted sales of $12.4 billion in 1991. Approximately $231 million will go to IS this year. A major initiative is the installation of a worldwide videoconferencing network.

The network, based on Integrated Services Digital Network, will eventually link 36 locations. It will reduce travel time and expenses as well as keep information moving more smoothly throughout the organization. It will also help the company communicate better with its customers and suppliers, says Ronald Morris, vice president of information technology. ■

Lyons is an Ann Arbor, Mich.-based freelance writer.

Luring consumers with conspicuous efficiency

Limited but well-targeted spending pays off

▶ BY LUCIE JUNEAU

BOB MARTIN *heads IS at Wal-Mart, a leader in inventory management*

The spend-what-you-earn Eighties have turned into the frugal Nineties, and retailers, as well as their suppliers, are feeling the chill. Even supermarkets are hurting. "You normally think of trading down as buying hamburger instead of sirloin, but this time we have seen the consumer go straight from sirloin to pasta," says Joseph C. Ronning, a retail analyst at Brown Brothers Harriman & Co., a New York investment research firm.

To survive, retailers are clinging to the tried and true: great service and lower prices. To offer the lower prices consumers demand, retailers must rein in expenses. That's where technology comes in. Many retailers are implementing inventory management systems, which cut overhead costs and prevent loss of customers because of low stocks of high-demand items. Nordstrom, Inc., for example, is rolling out an item inventory system that includes the use of radio frequency universal product code (UPC) scanning devices and touch-screen personal computers to help merchandisers make smarter buying decisions and allow them to monitor the unexplained loss of goods.

Continued on page 40

KEY TECHNOLOGIES

NOW
- EDI
- On-line customer service
- Inventory management systems
- Data management tools

NEXT FIVE YEARS
- Wireless data networks
- Order and supply-chain applications
- Open systems

INDUSTRY LEADERS

1. **Bob L. Martin**
   Executive V.P. and CIO
   Wal-Mart Stores, Inc.
2. **C. A. Carlson**
   President, Sears Technology Services
   Sears, Roebuck and Co.
3. **Andrew McKenna**
   Senior V.P., IS
   The Home Depot, Inc.
4. **Vincent Heiker**
   V.P.
   FoxMeyer Corp.
5. **Malcolm Ritchie**
   V.P., IS
   Dillard Department Stores, Inc.
6. **David M. Carlson**
   Senior V.P., Corporate IS
   Kmart Corp.
7. **Denny Steele**
   Executive V.P.
   Bergen Brunswig Corp.
8. **C. Ray Raulerson**
   V.P., IS
   Winn-Dixie Stores, Inc.
9. **Dennis Healey**
   V.P., MIS
   Toys R Us, Inc.
10. **Charles T. Mitchell**
    DP Manager
    Nordstrom, Inc.

PHOTOGRAPHY BY KENT HANSON

Of course,

your applications run on Sun.

Lotus 1-2-3
OpenImage
XDP
Imageflow
ATW
Interleaf 5
ERDAS
IES
Adabas
LOGISCOPE
Quantum
TMS
R Word
ABAQUS
BANNER
Rasterflex 32
FIDAP
Twin Sun, Inc.
TRICS
Quote Tracker
TMARK
TruFax
AutoPLAN
TeleUSE
CADDS
Docuvision
Supra
Informix
Resumix 3000
Uniplex Business Software
DADS
APEC SUPER-DUCT II
HVAC Drafting
OPUS
Oracle
ATA
ObjectStore
FIMS
TAAM
Logitours
Tradelook
TIB
Wordperfect 5.0
Sun IATE
IT1
OMNISERVE
Aster*x
20/20
Camex Breeze
Scitex Unda Image Station
UNI FCMS
PRO TRANSIT DATA
TDMS
ELOG
POLYGRAF
UNIRAS
PV-WAVE
Teamwork
Looking Glass
CCC
MEDUSA
Maple
UNIGRAPHICS
DynaText
PATRAN
GLOSS
EFFIX FINANCE
VHDL System Simulator
INSIGHT
Arts & Letters Composer
ANALYST
WordMARC
Artisan
PowerHouse
Altsys Virtuoso
UniVu
Express SERVER
MathCAD
HOOPS
Tuxedo
Analog Design & Analysis System
Scitex Unda Page Station
SKEMATIX
Prophecy
SAS
COSORT
FS Partner for UNIX
RealTime MIPS
XTrade
OFFICE POWER
T.O.P.S.
Ethershare
Gatorbox
TMA SUPREM-3
UltraNet
Arbortext Publisher
VYPER
PrestoServ
Express/EIS II
EPIC
Trader WS
Belvedere Finance
UNI Plan
FA*SQL
FourGen Accounting
Gecko Time
SMartCAM
SAMMI 2
Pertmaster
LEGALIMS
R Word+
BEST ACCESS
AUTOKON
Symix
MARCH PLAN
RenderMan
OASYS
Sherpa DMS
CMS
SCADACOM
CimStation
ASPEN PLUS
Genstat 5
Open Molecule
Genamap
M/SQL
TumorTrak
Image-Pro
Visualization Workbench
VG-1281
VICOM-VME
CGM-View
VAPS
Eiffel
UNI Track
XVT
HINDSIGHT
ALEX
MicroFocus COBOL
G2
INFORMIX-NET
Prolog
AR*SQL
MathStation
ONTOS C++ DBMS
GEMSTONE
Amplify Control
KBMS
Ful/Text
UNIFY 5.0 RDBMS
Sigmac
SBox
Turboswap
AutoCAD
ARC/INFO
S-PISCES 2B
Fuzzy-C
ANVIL
STAAD III
FrameMaker 3.0
SITE
UniVision
MOSS
PixTex
Topic
LANDCADD
Risk Manager
HELIX I
RPM Emulation
SCICARDS
Concept Express
PRISMA
Vanguard
ARRIS
F/X Planning
CHARISMA
Systems Integration
SAS/AF Software
CIM CAM
Digital Photo
VERSANT
Cloverleaf
DI-3000
SAS/OR Software
Data Workbench
C-ISAM
INFORMIX-4GL
Teamwork/IM
VERSANT Star
Z-Display
INGRES/STAR
Oracle*Mail
SQL*Net
UNIFY 2000
Wingz
F/X Design
APT Workbench
FOCUS
CIM CAD
PicSure Plus
CIM SURF
SAS/QC Software
P/COMPOSITE
AP*SQL
Precise/MPX
SAS Systems
P/CONCEPT
Vividrivers
MM600
Sybase
CA-Tellaplan
INFORMIX-SQL
Empress
OASIS
Decision Power
Ingres
ACS
VERSAFILE
Gupta
M/VISION
CADKEY 4
CIM CAD3D
Personal Designer
P/MECHANISM
VersaCAD
Teamwork/RT
ADAS
Teamwork/ADA
CIM CUT
DI-3000 XPM
Teamwork/SA
IAS
ACCELL/CP
Plan
Series 5000
GlobalView
Ta-Dahl

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCstation is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

SYBASE SQL Server
CorelDraw
CEAL
ACCELL/SQL
BASE Design
F/X Management
CADPIPE FORMS
MarketSheet
Analytix
APEC EDP-I
S-MINIMOS5
Teamwork/SD
SSAMPLE
ACCELL/Net
BASE Plan
APEC ESP-II
P/THERMAL
APEC HCCL-I
Vectorpipe
CADPIPE ISO
GT STRUDL
TestBench
LASER
P.Ink Press
FLEX
Knowledge Craft
RT/Expert
NEXPERT OBJECT
Allegro CL
Franz Lisp Opus 43
UX400S
PO*SQL
CA-TELLAGRAF
BBN/Slate
Clarity Rapport
Q-OFFICE +
APEC HCC-III
P/FATIGUE
R Desk
dBASE IV
CAD 3-D
Uniplex Windows
VSI*FAX
Colorpoint PS
SCSI488/S
Solitaire Royale
MX2400
CliqAccessories
Q-ONE
Composite Image
FORMTEK:VIEW
MX600
ScanWorX
BASISplus
QUIKDIG
Explorer Lsim
2DI
MIMIC
GDT Designer
DISCO
SierraSEIS
STATIX
CATS MEOW
AutoTherm
HSPICE
CADAT
SES/Workbench
PLS-SN
VERIFAULT-XL
IM*SQL
OE/SA*SQL
SUPER-COMPACT
ELLA
LOCAM
ESPRIT-UNIX
ABEL
ChipMaster System
TESTSCAN
LineCalc
SIVA
Express V-HDL
CADENCE
ORACLE Graphics
MICAD
Touchstone
CADPIPE ORTHO
TimeMill
VISAGE
Silicon Integrator
VESPA
Board Designer
QUIKLOG
Cable Station
STRATLOG
Tech Image
CAECO Designer
UTMOST II
Design Architect
GL*SQL
SPSS Graphics
PostScript Interface
PREDICT
Explorer AutoCells
SSUPREM4
GENESIL Designer
FORMTEK: SKETCH +
Hybrid Station
VERILOG-XL
Mixsim II
GIGA
MASTER
Image Markup
ADAMS/Tire
DV-Tools
S-MINIMOS4
DEPICT-2
TOPEX
SPSS Trends
SPSS
CliqWord
Tech Illustrator
ARC/INFO COGO
SPSS Tables
Leonardo
IKARUS
The Publisher
QUIK
NovaRedline
RAYMAP
TeX Full System
VRTXdesigner
OASYS File Server
ATHENA
SGML Publisher
SSPICE
Merge-All
FAME
TRIM-VALUER
VSS
MapInfo
TRIM II
System 9 GIS
ARC/INFO TIN
VideoView
XVIDEO-24SV
Advanced Visualizer
DISSPLA
Exponent Graphics
HOOPS Graphics System
FIGARO +
TEMPLATE
MSC/NASTRAN
VERITIME
8mm Tape Stacker
VXI-SB2020
Mathematica
INTELLIGEN
DV-Draw
Trapix PLUS
ASAP
Lasermap-A3
SB488
Accura Image
GPIB-S3/4 Kit
Budtool
Lasermap 386
DV Proto
ImageCorder 4700
TMA PISCES-2B
Phaser II SX
CATS
Allegro Matrix
MATLAB
Natural Language
UniVerse
TSUPREM-4
LASER Version 6
HR*SQL
InterBase
GPIB-S3/4P Kit
Pictor
S-CREEP
SUPRA
AIM Job Scheduler
EMPRESS 4GL
ITRAN
TURBO /ITI
SQR
WESTMATE
Image Edit
ADAMS/Vehicle
VME-SB2020
ADAMS/View
Image RasterQC
LPI PL/I
Image View
FORMTEK:TIMS
PrePARE
CADRA-NC
VERICUT
FACT
ICAD System
NC Polaris
IGES
NCL-CADD
PostWorks
PREPST
TecNet/Design
TED
MFG/PRO
Autoview
RS/1
CMC/Alert-U
MATRIXx
Cinema
SIMAN
MSC/PROBE
ANSYS
First Call
PHOENICS
SystemBuild
ADAMS
FORMTEK:SCAN
Cad Overlay
ESP
MM2400
ADAMS/Android
PreVIEW
ADAMS/Linear
CADRA-III
Series 7000
NCLCAM 502
Advance CAD
DesignView
CAD X11
MEDUSA (3D Design)
MSC/XL
Trombinoscope
FUSION
Gateway Server
SuperLAT
3B2
TSSnet
SharpShooter
NETWORK II.5
USECURE
Token Ring Interface
LMserver
MerIT/XNS
PREDITOR
Isotek
Prophet
Avalon Publisher
DSPACE
Control-Z
CODE V
MapAccess Toolkit
VRTX/OS
IsoTerm
ACCUMASTER
VxWorks
Statemate
AutoCode
SSUPREM3
Vbackup
VCL
BACKUP.UNET
Vnet
MODSIM II
EDIX
Allegro Composer
LPI COBOL
8mm Tape Jukebox
LPI FORTRAN
Vmail
Lucid C
SCOOP
CodeLink Station
Open Interface
VRTXvelocity
KIVA
CCC/Manager
Topexpress BCPL
QuickShell
FORM
Ups Debugger
VDIFF
SMARTsystem
GrafGen
CATS CD Manager
4mm DAT Jukebox
MACH PLAN
afs:TRADE
20/20
RealTime MIPS
AcuCOBOL
Advanced Life/UX
APT System
DRAFTS
AOSTRA Graphics System
INFINITY SQL_Trader
Apogee
Arts & Letters Maestro
Equity Watch
AutoLook
IrisGL
BondWatch
Agfa Pix
CATMAP
MarkeTrack-MX
METALS
CATS Market Data
GINOGRAF
Portfolio Monitor
InterACCOUNT II
CATS Risk Manager
FOTOS
Intex CMO Analyst
InfoBase
Class Speed
CRDB Chinese
COSMOS
ClientFocus
DecWrite
DEOS
INFINITY SQL_Curve
DEED
Devon Exchange System
FORWARDS
Imagen Edit
DORODOC
Archium
ECRM
OPTI-WARE
OpenRead Plus
Precise Review
Eclipse Computing, Inc.
FINANCE-1
SCO FoxBASE +
Foreign Exchange System
Intex Option Price Calculations
Freedom of Press
FPM
HedgeWatch
Ripware
IMAGES
EFFiX ATW
ImpoStrip
Swap Ware
I.M.S.
Investment Manager II
IRC/Hedge
CATS CAPWare
PORTS
INS-1
Island Write, Draw & Paint
Securitizer
ISYS
Virtuoso
IST/SHARE
NovaEdit
InTrader
TROPS
INFINITY SQL_Risk
VIEWGRAF
Imageport
CATS Accounting
ImageStep
Imagist 2
R Office Manager
StudioLink
RAMS
Imix Analyzer
Japanese UNIFY RDBMS
Lotus 1-2-3 Realtime
Maestro
KOSI
Magna Link
Q-CHART
Medi
Intex Calc
INFIN Mon
Mone Bon
CAM
DecP
Smar
News
Inter-
News
NAG
EquiT
FILTR
Neptu
Risk
MEDI
Nova
FX Sy
UniDa
Nova
Islan
Oracl
IsoFa
Rast
Page
SQL*T
UniKI
STAR
SynC
POWI
Risk
ProTy
Q-Cal
Noval
Q-DC
R Offi
Remo
STRI
Aviat
CATS

But we wouldn't leave it at that.

No matter what business application you need, you can run it on a Sun™ SPARCstation™ or a Sun SPARCserver.™

There's software for word processing, databases, graphics, spreadsheets, accounting and payroll, drafting and drawing. More than 4500 applications in all. Including favorites like Lotus 1-2-3,® dBASE IV,® and WordPerfect.®

But we wouldn't leave it at that. A Sun SPARCstation not only runs your favorite software, it can run them all at the same time, thanks to true multitasking. That means while you're busy writing a business letter, your SPARCstation can be calculating spreadsheets and searching databases in the background.

And while you're running applications on your SPARCstation there's something else working in the background: software development to introduce even more applications for Sun.

In fact, programmers prefer Sun as a development platform for its power and ease of use. Which means that should you wish to develop your own corporate applications, you will find a robust, tried-and-true developer tool kit.

Either way, more and more businesses are choosing to run their applications on Sun. Not only for what they can run on Sun, but for how they can run it.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 37

RETAILERS FIND *electronic systems for inventory and check-out efficient, profitable*

Retailers are finding that improving the logistical side through technology is a way to ensure payoffs, says Tom Hennessy, a consultant at retail consulting firm Davidowitz & Associates, Inc. Wal-Mart Stores, Inc., No. 1 among this year's *Premier 100* retailers, has long been a leader in this area, making extensive use of electronic data interchange (EDI) to communicate with its vendors, which helps speed products through the pipeline.

Retailers also continue to invest in network infrastructures to enhance both in-house communications and the exchange of information with trading partners.

The Home Depot, Inc., for example, is designing a Transmission Control Protocol/Internet Protocol (TCP/IP) network to carry EDI transactions over its Scientific Atlanta satellite network. This will also support credit transactions and heavy transaction processing applications. And Toys R Us, Inc. is testing a new satellite network to link its U.S. stores in a first step toward multimedia, videoconferencing and other applications with high-bandwidth requirements.

1

Wal-Mart Stores, Inc.

Wal-Mart's information technology is second to none, competitors and analysts agree. And it's probably no coincidence that the $54 billion company, based in Bentonville, Ark., is also the nation's fastest growing and most profitable retailer.

Wal-Mart enjoys exceptionally low operating costs and passes the savings along to customers, typically underpricing competitors. Armed with automated quick-response systems, Wal-Mart can maintain remarkably low inventories: A Wal-Mart store devotes 10% of its square footage to inventory, compared with an industry average of 25%.

Last year, Wal-Mart moved to provide sales figures to suppliers directly, speeding the automated replenishment cycle.

2

Sears, Roebuck and Co.

Falling behind Wal-Mart and Kmart Corp. in the retail sweepstakes was a rude awakening for industry giant Sears. In 1991, Sears' retail revenue of $34 billion trailed Wal-Mart by $10 billion and Kmart by $1 billion.

Roused to attention, Sears has moved to make its retail division more competitive by cutting operating costs. Recent measures include adding 28,000 CompuAdd Corp. cash register terminals to 22,000 existing NCR Corp. point-of-sale terminals (to be upgraded with new software). This move will allow Sears to cut about 1,000 full-time nonsales positions and 5,900 part-time jobs at its 868 stores, reducing annual operating expenses by about $50 million.

CHALLENGES

- Moving more quickly to production
- User training

3

The Home Depot, Inc.

When money is tight, the do-it-yourself home improvement business is good. Business is particularly good at Home Depot, now the largest U.S. retailer in the category. Sales at the company's 180-plus stores were up 35% last year.

To handle the increased business and its ongoing expansion, Home Depot will increase mainframe capacity 50% this year, after doubling it only a year ago. All in-store systems are being replaced with Unix-based Hewlett-Packard Co. processors in the belief that a commitment to open systems will help keep its costs down while maintaining flexibility for growth.

Soon a new TCP/IP network will carry EDI transactions and other traffic via Home Depot's satellite. Home Depot is expanding its use of EDI to improve inventory replenishment, adding new vendors to the system daily.

4

FoxMeyer Corp.

The 1990s have also been kind to Carrollton, Texas-based FoxMeyer Corp., the third-largest drug wholesaler in the nation. While most competitors are being squeezed, FoxMeyer's profits are up.

At the close of FoxMeyer's '92 fiscal year in March (a year in which FoxMeyer lost its hefty Kmart account), sales were up to $3.1 billion, a 6.9% jump from 1991.

FoxMeyer is migrating from midsize Unisys Corp. systems to IBM mainframes and has outsourced its IBM Enterprise System/9000-based data center to IBM. To reduce operating costs, FoxMeyer uses robotic picking devices and conveyor systems for some warehousing operations. FoxMeyer also reportedly leads its industry in EDI use, doing business electronically with more than 300 trading partners.

PHOTOGRAPHY BY ROBERT E. DAEMMRICH/TONY STONE WORLDWIDE

What would you like to know about Sun?

☐ Why should I consider Sun for general business computing?

☐ How have Sun solutions helped companies like mine?

☐ What is Sun's information systems strategy?

☐ How can Sun solutions help me redistribute the data processing workload throughout my business enterprise?

☐ How can Sun help me migrate and deploy key database applications from a proprietary to an open systems environment?

☐ What business applications can Sun deliver to me?

☐ What products does Sun offer in addition to workstations?

☐ What customer support solutions does Sun offer?

What industry are you in?

☐ Finance/Banking/Accounting
☐ Transportation/Utilities
☐ Insurance
☐ Telecommunications
☐ Health/Medical services
☐ Pharmaceutical
☐ Aerospace
☐ Automotive
☐ Electronics
☐ Retail
☐ Manufacturing
☐ Construction
☐ Engineering
☐ Oil/Gas
☐ Other: ______________

Just fill out the card and send it to us.

Name ______________________________

Company ______________________________

Title ______________________________

Address ____________________ City ______________

State ____________ Zip ____________ Country ______________

Telephone ____________________ Fax ______________

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

PLEASE FOLD BACK ALONG THIS LINE. DO NOT TAPE OR STAPLE

NO POSTAGE
NECESSARY
IF MAILED
IN THE UNITED
STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 11313 BRIDGETON, MO

POSTAGE WILL BE PAID BY ADDRESSEE

SUN MICROSYSTEMS, INC.
PO BOX 4491
BRIDGETON, MO 63044-9822

DEFINING REALITIES

BUDGETS
Although not historically big technology spenders, retailers and wholesalers are spending aggressively right now. Almost three quarters of the companies reported an IS budget increase last year. More than half expect one next year.

PRESSURES
With more budget dollars, IS managers are under increased scrutiny. Targeted IS investments are the key to winning management's approval.

ORGANIZATIONAL CHANGES
This industry has had the smallest incidence of data center consolidation. However, almost three quarters have plans to consolidate in the coming year.

5

Dillard Department Stores, Inc.

Dillard Department Stores in Little Rock, Ark., began computerizing operations in the 1960s. With sales and earnings continuing in a strong upward direction, the company remains a firm advocate of the importance of information systems.

"We've got computers, EDI, data capture tools — all the latest and greatest technology," says Ray Heflin, Dillard's director of quick response. The company has already reaped many of the benefits that quick response systems can provide: the ability to replenish goods more quickly, greater turns on inventory, increased sales and fewer price markdowns.

Now Dillard is embarking on a campaign to persuade suppliers to adopt just-in-time manufacturing.

6

Kmart Corp.

Discount retailers can't afford to be cheap. Troy, Mich.-based Kmart, the nation's second-largest retailer, has spent more than $1 billion on information techology since 1985 and is spending nearly $3 billion to refurbish its stores. It has plenty to show for the investment: Profits grew 14% to $859 million last year.

In the IS arena, Kmart has adopted the latest in quick-response technology: UPC bar-code marking and scanning, shipping container marking and reading and an EDI program involving more than 2,000 vendors.

This year, Kmart is equipping its 2,300 stores with handheld spread-spectrum RF devices that will not only speed price checks but also automatically trigger reorders and inventory updates.

7

Bergen Brunswig Corp.

"We don't make products; we distribute others' products," Bergen Brunswig's Chief Information Officer Denny Steele says. "The more efficiently we do that, the more competitive pricing we can offer and the more business we get."

The $4.9 billion Orange, Calif., company operates 31 distribution centers with just 3,000 employees, 195 of whom are in IS, Steele says. In a major organizational shift during the past year, system developers were moved to the functional departments — marketing, warehouse operations, sales and finance.

The company's $20 million IS budget is about 5% higher than last year. The extra money is pegged to enhance efficiencies at the warehouse level, adding automated replenishment systems to the distributor's automated picking capabilities.

8

Winn-Dixie Stores, Inc.

Winn-Dixie Stores is making a comeback. After falling off the pace in the mid-1980s and losing market share to relative newcomers such as Albertson's, Inc., the Sun Belt's largest food chain is introducing bigger, brighter supermarkets and more efficient systems.

Still behind the technology curve relative to some of its competitors, the Jacksonville, Fla.-based company is quickly coming up to speed.

By late June, Winn-Dixie had installed new minicomputers in its 1,200 supermarkets in the U.S. and the Bahamas. The minicomputers will support computer-assisted ordering as well as time and attendance scheduling, according to Jack Russo, a retail food analyst at St. Louis-based A.G. Edwards.

9

Toys R Us, Inc.

Toys R Us has pretty much eliminated all the major competition in its own league. The Paramus, N.J.-based retailer, which controls more than 20% of the domestic toy market, will open 100 new stores around the world this year, while Child World and Lionel's Kiddie City are no longer competitive.

The real games may be just beginning, however. Some big mart kids — Wal-Mart, Kmart and Dayton Hudson Corp.'s Target stores — are moving into the neighborhood and challenging the $6.12 billion specialty chain.

Toys R Us won't be caught short in IS. To provide for growing bandwidth needs, it is upgrading networking capabilities and testing a new Hughes Aircraft Co. satellite — the first to carry an Ethernet wide-area network — that will link 200 of its more than 800 Toys R Us and Kids R Us stores by year's end. A new data center in New Jersey will house a variety of satellite earth stations.

10

Nordstrom, Inc.

California has been taking it on the chin in this recession, and Seattle-based Nordstrom, which does about half its business there, has felt the impact. But rather than simply waiting out the situation, Nordstrom is using IS to buttress its position.

With a budget of $25 million, its IS group set out to improve the quality of inventory information. The result was a prototype item inventory system — installed in Oregon in May — that uses handheld, remote RF scanning devices to help buyers determine which items are selling well.

In addition, a new VIP Express electronic-mail system allows suppliers to communicate with Nordstrom's geographically scattered buyers via MCI Mail.

The system will allow buyers and suppliers to exchange shipping data and check the payment of invoices. ■

Juneau is a free-lance writer and editor based in Salem, Mass.

The name of the game is revenue generation

With the right systems, information can be a money-maker

▶BY JULIA KING

Over the past few years, almost anything that could go wrong has gone wrong in the transportation industry. Airlines, already staggered by fuel cost increases and loss of business during and after the 1991 Persian Gulf war, are now bloodying one another in cutthroat fare wars. Trucking firms struggle to differentiate their services in a sector reeling with capacity overload.

Industrywide, all companies are up against brutal competitive pressures as old business boundaries disappear and previously distinct businesses move into one another's sectors.

In response, transportation firms are looking to information systems for fresh sources of revenue.

Airline, trucking and express package delivery companies have all created information-intensive businesses specializing in shipping logistics. These enterprises — based in large part on sophisticated electronic data interchange (EDI) networks — book air, land, sea and rail transport, handle shipment tracking and, in some cases, manage warehousing and inventory functions for corporate customers.

One major player is AMR Corp., the parent company of American Airlines, which partnered with rail giant CSX Corp. and the Postal Telephone and Telegraph authorities in the Netherlands to create what Max Hopper, senior vice president of information technology, calls "a Sabre system for the cargo world."

INDUSTRY LEADERS

1. **Max D. Hopper**
   Senior V.P., IS
   AMR Corp.
2. **David A. Billings**
   V.P., Information and Technology Systems
   Airborne Freight Corp.
3. **Jerry Long**
   V.P., Summit IS
   Roadway Services, Inc.
4. **Barry Kotar**
   Senior V.P., IS
   Northwest Airlines
5. **Larry Davenport**
   V.P.
   J. B. Hunt Transport Services, Inc.
6. **Wayne Nixon**
   Director, IS
   International Shipholding Corp.
7. **Dennis Jones**
   Senior V.P.
   Federal Express Corp.
8. **Frank Quirit**
   Director, IS
   Hawaiian Airlines
9. **John Wm. Rudasill**
   President, Carrier Computer Services
   Carolina Freight Corp.
10. **Dan Hay**
    V.P., Systems
    Southwest Airlines

1

AMR Corp.

Fort Worth, Texas-based AMR is responding to the economic crisis facing all passenger carriers with a two-pronged strategy of continued large-scale investment in long-term technology projects and deep cost cuts affecting virtually every in-place system and service. Moreover, to help stem a 1991 loss of $241 million, all new IS projects — including this year's multimillion dollar sales force automation effort — have been placed under an immediate 100% return-on-investment mandate.

On the investment side, there is not only AMR's partnership stake in Encompass, the multibillion-dollar, EDI-based, multimodal cargo shipping logistics system but also its ambitious InterAAct office automation system. InterAAct will link 70,000 employees on personal computers and local-area networks over a single network, with access to all company databases and electronic services.

InterAAct is expected to reduce costs by eliminating redundancies, but AMR has also introduced more direct cost-cutting measures. Lower prices are being negotiated on all computer purchase and maintenance contracts. Applications are bought rather than built whenever possible. IS staffing has been reduced on some projects, and other projects have been eliminated altogether.

2

Airborne Freight Corp.

EDI-based shipping, invoicing and payment systems shaved 8 cents from Airborne's average cost per shipment in 1992, bringing it down to 36 cents. Meanwhile, total shipping volume for the company, more commonly known as Airborne Express, increased 24%, with 45% of all shipments tendered electronically via the company's Linkage and Libra systems.

Linkage connects the shipping systems of high-volume customers to Airborne's mainframe. Libra combines EDI with PCs, scales and printers so that customers can electronically weigh freight, calculate rates and print shipping labels. This year, Airborne introduced a PC-based software product that allows customers to generate their own invoices.

3

Roadway Services, Inc.

Akron, Ohio-based Summit Information Systems, the IS subsidiary of $3.1 billion Roadway Services, has concentrated most of its efforts this year on two systems that were designed to answer customer demand for up-to-the-minute shipping information.

CHALLENGES

- Personnel/Human resources
- Process improvement

KEY TECHNOLOGIES

NOW

- On-line customer service
- Shipping tracking systems
- Networks

NEXT FIVE YEARS

- Open systems
- Client/server systems
- Pen-based PCs

One is an automated data collection system that uses 5,000 bar-code scanning terminals to track individual cartons. The other is the Roadway Advanced Planning for Inbound Dispatch system, a desktop shipment information management system that provides customers of the less-than-full truckload carrier with real-time data on all shipments.

Summit's next step is to equip drivers of the company's 37,000 trucks with handheld devices to record information at the time of pickup and therefore eliminate as much as an hour's delay in information availability.

4

Northwest Airlines

Northwest Airlines grabbed headlines earlier this year when it introduced Worldlink, the first in-flight communication system providing passengers with video-based entertainment and shopping services. But the bulk of IS work at the privately held airline has been behind the scenes — platform downsizing and re-engineering for open systems.

So far this year, Northwest has invested in Unix-based applications to run on a Sybase, Inc. engine over LANs. New applications include systems for gate management, pilot and route scheduling and pricing.

Continued on page 46

AMR's MAX HOPPER *balances economics and strategic imperatives*

PHOTOGRAPHY BY DAN BRYANT

I own four toasters.

One for rye.
One for wheat.
One for grain.
One for pumpernickle.

I own five ovens.

One for ham.
One for turkey.
One for chicken.
One for lamb.
And one for roast beef.

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All SPARC trademarks, including the SCD Compliant logo, are trademarks or registered trademarks of SPARC International, Inc. SPARCstation is licensed exclusively to Sun Microsystems, Inc. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

If this sounds like your corporate computing department, maybe we should talk.

Look around your computer department. How many minicomputers have you inherited? And how well are they working together?

May we offer a simple suggestion to set things straight?

Integrate them with a Sun™ client-server platform. Sun not only connects what you have in place already, but will connect with what you'll add in the future, too.

Sun servers and workstations coexist peacefully with your mainframes, PCs and servers, no matter what their operating system. Sun is truly open.

And every Sun computer, whether workstation or server, is built on a RISC-based architecture that scales from laptop to supercomputer. So system building from the desktop to the mainframe is simple, modular and coherent. Your software even stays the same, so you waste no time rewriting.

What's more, individual Sun products, whether workstation or server, are themselves designed to grow as you need more power. You simply plug in a SPARC™ module as the need arises.

The result: An information technology organization that you can tie together once and for all, built on a platform you can grow with once and for all.

And, surprisingly, you can begin with workstations priced at under $5,000.

To see how other corporations have done it, and how much they have saved with Sun client-server computing, call 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

Continued from page 43

Although the major impetus for architectural changes has been customer service, Northwest is also positioning itself for targeted expansion into international markets. This year's transfer of mainframe-based financial data to LANs was a key step, permitting faster and more accurate projection of demand for seats and routes.

5

J. B. Hunt Transport Services, Inc.

The main thrust of the 80-member IS team at J. B. Hunt has been supporting the less-than-full truckload carrier's diversification into shipping logistics, flatbed hauling and hazardous waste transport. This year, Hunt's IS department will rewrite 80% of existing application code to accommodate the requirements of these new businesses.

By year's end, the company's 6,000 trucks will also be outfitted with IBM Personal System/2 computers linked to an optimization system that integrates data needed by the carrier, its drivers and customers, and five new partners in the railroad industry. Among other things, says Lawrence G. Davenport, senior vice president of information services, the company hopes that the system's ability to track drivers' routing, refueling and scheduling requests will increase job satisfaction and reduce turnover.

6

International Shipholding Corp.

International Shipholding, or ISC, is the $309 million parent company of four waterborne freight shippers: Central Gulf Lines, Inc., Waterman Steamship Corp., Forest Lines, Inc. and LCI Shipholdings, Inc.

At the end of 1991, ISC had in place contracts that would employ the majority of its fleet for this entire year. But continued economic uncertainty here and abroad makes business forecasting a difficult exercise, according to ISC Chairman Niels W. Johnsen. Approaching the future cautiously, ISC's chief business goals in 1992 are controlling expenses and improving overall efficiency.

DEFINING REALITIES

BUDGETS

Despite poor business conditions, more companies in the transportation field received budget increases than did companies in any other industry.

PRESSURES

The IS focus is on producing revenue in the face of declining customer bases, higher logistics costs and brutal competition.

ORGANIZATIONAL CHANGES

Most of these companies consolidated their data centers in the last year.

PLATFORM CHANGES

Most of these companies plan on installing proprietary systems within the next 12 months.

7

Federal Express Corp.

The showpiece of recent IS efforts at Fedex is its Ramp Management Advisory System (RMAS), which uses Unix-based workstations and expert systems software to track more than 85 inbound and outbound flights daily at the company's major airport hub in Memphis. Fedex considers RMAS the launch point for its planned expansion into networked expert systems. In the meantime, although its IS spending remained flat at $360 million for 1992, the $7.7 billion express shipper has continued its march toward real-time distributed computing, replacing terminals with Unix-based workstations at 1,000 shipping stations. Full conversion will be completed by 1995, according to Jon Riker, vice president of corporate systems development.

8

Hawaiian Airlines

HAL, which operates Hawaiian Airlines, Hawaii's largest airline, and the West Maui Airport are using information systems to regain market share. The strategy — initiated by a group of investors led by Peter Ueberroth and his brother John, who is chief executive officer — calls for deep price cuts and a customer service focus, backed by IBM mainframe applications.

So far, the company has managed to reverse a reputation for late arrival with 98% on-time performance and to build back market share from 33% to 45%.

9

Carolina Freight Corp.

Enhancement of a broad array of value-added shipping information services is the main systems goal at Carolina Freight, or CFC, in Cherryville, N.C.

CFC's IS subsidiary, Carrier Computer Services, Inc., processes more than 165,000 EDI transactions monthly, furnishing high-volume customers with on-line shipping, invoicing and payment information. Lower-volume customers can access rate and shipment status data via an automated voice-response system. A service dubbed "Caro-Fax" furnishes computer-generated manifests, shipment status reports and other messages directly to customers' fax machines.

These system innovations have given CFC the means to provide customers with more information without increasing customer service staffing.

10

Southwest Airlines

A lean and mean IS strategy is at the heart of $1.3 billion Southwest's sustained success in the regional air transport business. Working with a modest budget — $4.7 million — its 60-member IS team developed several new systems in 1992.

Heading the list is the Southwest Integrated Flight Tracking system, or Swift, which consists of two linked systems. One part is a client/server-based integrated flight operations system that combines data from various radar and weather services and allows Southwest to generate its own real-time flight plans. The other is a real-time aircraft situation display, which permits precision planning of ground service and connecting flight schedules.

Other important systems projects activated this year include a PC-based ticket-by-mail system and a network of Quick-It automated ticketing machines. ■

King is a free-lance technology writer based in Ridley Park, Pa.

Betting the farm on technology

In this field, if you're not ahead, you're vulnerable

▶ BY AMY BERNSTEIN

Nearly 10 years ago, when deregulation punctured AT&T's long-distance monopoly, twin challenges — increasing competition and changing consumer demands — loomed before staid Ma Bell. The rules of that game were changing from a world where, in place of unchallenged rate increases, one had to provide better service at the lowest possible cost. Deregulation accelerated those trends.

Today AT&T still retains a healthy 70% share of the long-distance carrier market. But fierce competition has transformed the entire industry into a technology-driven race in which each player must develop and deliver a constant slew of consumer-friendly products and services while relentlessly holding down costs.

Meanwhile, the nation's electric and gas utilities are just coming to grips with their tumultuous era of deregulation. New federal laws make it easier than ever for independent power producers and cogenerators to sell power and/or pipeline transmission capacity directly to consumers for less than the established utilities do.

MCI's ZUCCO *stays ahead of the ongoing rollout of new services*

INDUSTRY LEADERS

1. **James L. Zucco Jr.**
   Senior V.P.
   MCI Communications Corp.
2. **Joseph T. Ambrozy**
   V.P., Operations and IS
   Bell Atlantic Corp.
3. **R. Thomas Dwyer**
   V.P., IS
   Carolina Power & Light Co.
4. **M. Euel Wade Jr.**
   CIO
   Southern Co.
5. **Tod O. Dixon**
   V.P., Information Resources
   Northeast Utilities
6. **Mike Friduss**
   V.P., Customer Service and Information Technology
   Ameritech Corp.
7. **George E. Stubbins**
   V.P., IS
   Duke Power
8. **J. E. Hunter**
   Manager, IS Department
   Baltimore Gas & Electric
9. **Dennis Murphy**
   Director, Corporate IS
   GTE Corp.
10. **W. F. Osl Jr.**
    V.P.
    AT&T

KEY TECHNOLOGIES

NOW

- LAN applications
- Telecommunications
- DBMSs

NEXT FIVE YEARS

- Open systems
- Client/server systems
- LANs

PHOTOGRAPHY BY KATHERINE LAMBERT

Not surprisingly, change is triggering massive internal restructuring among utilities as they struggle to move to a market-driven culture and infrastructure. As with telecommunications, technology is the critical enabler for the utilities; it is the engine of corporate reinvention. The utilities are still exploring the mandate that telecommunications firms have been implementing for years: Use technology in every way possible to drive down costs unilaterally while continually improving quality and customer service.

For telecommunications companies, which are further along in the technology-driven restructuring process, the next big push is to develop a client/server architecture that streamlines the flow of information from mainframes to desktops. This allows employees in far-flung offices to more quickly and efficiently retrieve data, such as customer billing records, on demand.

MCI Communications Corp., the *Premier 100*'s No. 1 utility for the fourth consecutive year, has a strong grip on these complex initiatives. The company is committing its substantial information systems resources to everything from virtual private network services to lights-out data center operations.

1

MCI Communications Corp.

The nation's second-largest long-distance carrier performed impressively last year: MCI's earnings nearly doubled, to $522 million, on revenue of $2.16 billion — close to double the industry growth rate for 1991. One of the company's high-profile new products, the Friends & Family program, alone generated more than 5 million new long-distance customers.

No wonder, then, that MCI's IS organization is bucking the industry trend toward flat or downsized resources. In 1992, it had staff increase of 250, to 2,050 total, and a budget increase of 4.5%, to $460 million.

In the works is a move toward "800 portability," whereby toll-free 800 numbers would be owned by customers, not carriers. MCI won't detail strategies but admits to readying billing and reporting systems for an anticipated increase in volume. Rollout is scheduled for March 1993.

DEFINING REALITIES

BUDGETS

Deregulation has unleashed competition among utility companies, resulting in this year's flat budgets.

PRESSURES

New competitive threats range from large customers providing their own services to independent companies offering lower cost products.

ORGANIZATIONAL CHANGES

Almost three quarters of these companies plan to consolidate data center operations in the coming year. Most have a mixture of centralized and decentralized organizations.

PLATFORM CHANGES

Nonproprietary systems are on almost everyone's lists. Three quarters of these companies plan to downsize from larger platforms to smaller ones.

CHALLENGES

- Managing PC/LAN technology
- Delivery of corporate business applications
- Networking

Nearly completed is a new networked customer service system of 7,000 IBM OS/2 licenses and an equal number of Personal System/2 Model 90 workstations.

2

Bell Atlantic Corp.

Bell Atlantic, the third-largest provider of local telephone services, is caught up in an effort to essentially "rebuild everything" by the year 2000, according to Joseph T. Ambrozy, vice president of IS and chief information officer.

System 2000 — a $2 billion, 10-year commitment to boosting productivity and competitiveness — involves rebuilding virtually all front-end applications driving the company. One facet: a new Unix-based application for 6,000 customer service representatives.

3

Carolina Power & Light Co.

Carolina Power & Light's ongoing commitment to total quality management (TQM), now in its sixth year, has deeply affected the way the $2.6 billion utility formulates and implements IS strategy.

A new customer billing system — initiated in 1988 as a result of TQM studies — is slated to go on-line at the end of this year. The new system is expected to yield 25% to 30% improvements in productivity overall. And in the early stages is a new activity-based cost management system that breaks down costs by work effort and project. The DB2-based system should go on-line in late 1993.

4

Southern Co.

Southern, in its best year since 1989, posted a 35% gain in first-quarter earnings over '91. The firm serves 120,000 square miles in the Southeastern U.S. and excels at cutting costs while improving infrastructure.

Case in point: Under CIO M. Euel Wade Jr., Southern has laid 1,400 of 2,500 miles of fiber-optic cable. The completed backbone network will tie far-flung plants to the company's headquarters in Atlanta. By cutting deals with long-haul carriers that use Southern's transmission-line rights-of-way, the utility is saving $75 million in capital expenditures while strengthening vital voice and data systems.

Still in the prototyping stage is a massive geographic mapping and facilities management system that will provide precise information on where and when outages occur.

5

Northeast Utilities

Northeast Utilities (NU), the parent company of New England's largest electric utility system, is scrambling to compete in a deregulatory environment. NU's 378-person IS operation is responding, in part, by building innovative new alliances to improve customer service, tighten operations and achieve new economies of scale.

For example, an unusual agreement with IBM, Northern Telecom, Inc., AT&T and other providers will result in a Caller ID system that enables customer service representatives to capture critical information during a power emergency.

On another front, NU's just-completed

COMPUTERWORLD

Professional Courtesy Rate

YES, I want to receive my own copy of Computerworld each week. I accept your offer of $38.95* for 51 weekly issues.

Address is: ☐ Home ☐ Business Basic rate: $48 per year.

* U.S. Only. Canada $74.97, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Name ____________ Title ____________

Company ____________

Address ____________

City ____________ State ____ Zip ____

Please complete the information below to qualify for this special offer.

1. BUSINESS/INDUSTRY (Circle one)

- **10.** Manufacturer (other than computer)
- **20.** Finance/Insurance/Real Estate
- **30.** Medicine/Law/Education
- **40.** Wholesale/Retail/Trade
- **50.** Business Service (except DP)
- **60.** Government - State/Federal/Local
- **65.** Communications Systems/Public Utilities/Transportation
- **70.** Mining/Construction/Petroleum/Refining/Agric.
- **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
- **85.** System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- **90.** Computer/Peripheral Dealer/Distr./Retailer
- **95.** Other ____________ (Please specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

- **19.** Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
- **21.** Dir./Mgr. MIS Services, Information Center
- **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
- **23.** Dir./Mgr. Sys. Development, Sys. Architecture
- **31.** Programming Management, Software Developers
- **41.** Engineering, Scientific, R&D, Tech. Mgt.
- **60.** Sys. Integrators/ VARs/Consulting Mgt.

CORPORATE MANAGEMENT

- **11.** President, Owner/Partner, General Mgr.
- **12.** Vice President, Asst. VP
- **13.** Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- **51.** Sales & Mktg. Management
- **70.** Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

- **80.** Educator, Journalists, Librarians, Students
- **90.** Other Titled Personnel

3. Does your job function require involvement with your company's or your client's computer/information systems/data processing/communications systems? (Please check only one)

☐ YES ☐ NO

♻ *Recycled Paper* E42JP-2

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

Natural Activity-based Accounting System helps IS track precise project expenditures using IBM's DB2 relational database. NU's partner in the $35 million project was Arthur Andersen & Co.

6

Ameritech Corp.

Ameritech Services, the technology arm of the nation's seventh-largest telephone holding company, is in the midst of an ambitious restructuring effort designed to help the company lower costs and become more market-driven.

The first order of business is linking each of 15 core "business processes" — customer billing, repair, marketing and so on — with the IS people and functions that support them. In this way, the various business units and their IS support teams strive together toward goals such as 24-hour, seven-day customer support.

To support this market-driven strategy, Ameritech has budgeted $150 million this year for new IBM Enterprise System/9000 mainframes, an Open Systems Interconnect data network, an NCR Corp.-based client/server network and four new data centers.

7

Duke Power

The mandate for IS at Duke Power — to help lower the cost of generating electricity — reflects difficult economic times at one of the nation's most efficient utilities.

One major IS initiative involves streamlining centralized telephone service to utility customers after hours. The IS department is developing a suite of applications that make it easier for service representatives to extract customer account data using the customer's phone number rather than a complex customer ID. The new system will enable fewer people to handle more calls.

8

Baltimore Gas & Electric

Despite a 7% cutback in its $65 million IS budget this year, Baltimore Gas & Electric (BG&E) is knee-deep in IS projects. The most important is a wide-area network, budgeted at $2.5 million, that will connect 11 BG&E business locations in Maryland. The data network's open systems architecture should improve local-office access to data and eliminate intraoffice paper trails.

During the next couple of years, the network will support many critical new applications running on multivendor platforms, such as a $7 million customer information analysis system that improves anticipation of emergencies such as residential power outages.

9

GTE Corp.

GTE is the nation's largest local phone company and the second-largest cellular telephone provider, thanks to last year's $6.6 billion merger with Contel Corp. It is also among the most profitable: Local phone traffic grew 8% last year, besting the 2% industry average.

Despite phenomenal growth, GTE's 1992 IS budget of $800 million is about even with last year's, and head count is flat. Roughly 60,000 PCs are in place now, compared with 20,000 three years ago.

Like its rivals, GTE is focusing on building a client/server architecture. A three-year, $150 million agreement with Hewlett-Packard Co. will result in hundreds of new servers and workstations. Once completed, the new architecture will allow GTE to internally publish more than 1,200 telephone directories, a job that is now outsourced. The directories contribute $1.2 billion yearly to GTE revenue.

10

AT&T

Even with 70% of the long-distance market in hand, AT&T isn't taking anything for granted. The company paid $7.4 billion for NCR last year as part of a long-term strategy to make AT&T a one-stop shop for worldwide voice-data networks and attendant equipment.

The acquisition is fueling a major IS push to incorporate NCR's local-area networks and processors into a new client/server architecture that will make it easier for 21 business units and as many supporting divisions to quickly access data locally. For example, individual customer records that once resided on a central mainframe can now be accessed locally.

AT&T views this re-engineering process as essential to speeding up customer service, improving accountability and eliminating the number of people involved in each business transaction.

Overall, AT&T expects savings of 65% to 75% over five years from re-engineering and ongoing data center consolidation efforts — with no planned cutbacks in IS staffing, which hovers around 20,000. ■

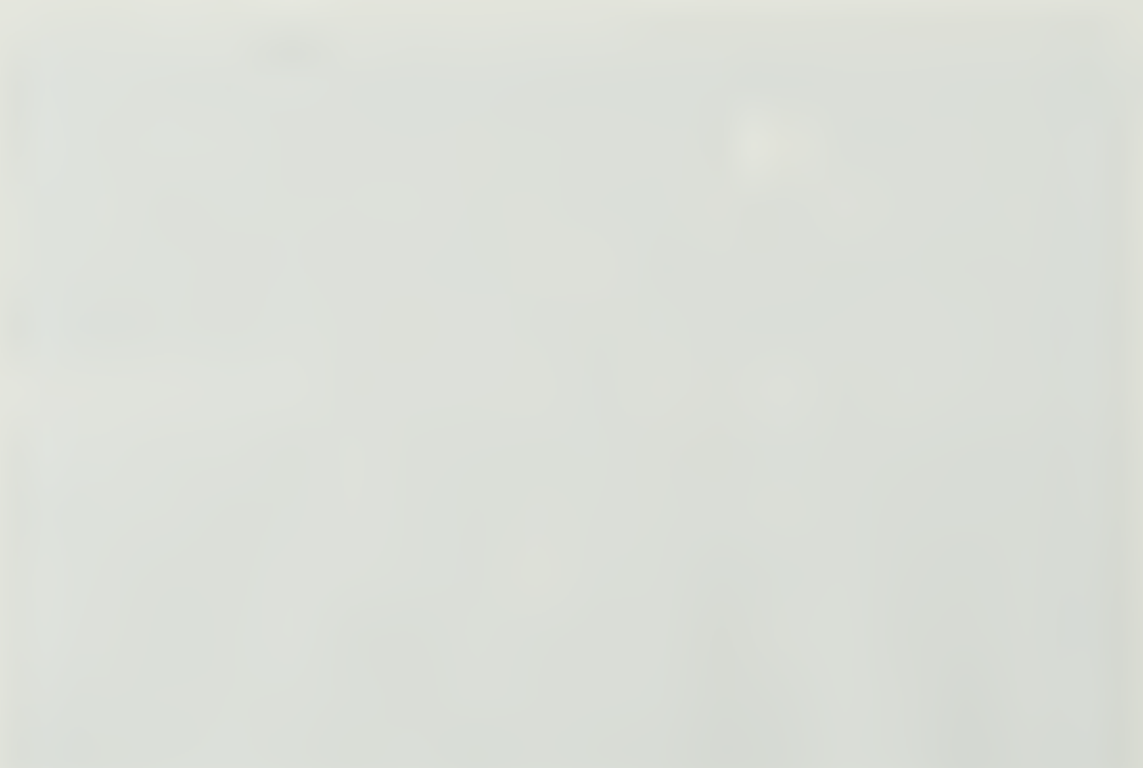
Bernstein is a free-lance writer based in Baltimore.

GOOD SERVICE, *supported by IS tracking systems, is a primary goal for utilities*

PHOTOGRAPHY BY DAVID JOEL/TONY STONE WORLDWIDE

Eastman Kodak Company

Major rightsizing, 35 centers
Faster access to information
Improved decision making
Client-server computing with Sun.



©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

One day. That's how long it was taking to get information from the mainframe to customer service representatives in the field.

One day too many for Kodak.

The solution? A Sun™ client-server system that put information into the hands of its Customer Service Group when they needed it. Any time of the day or night. Thirty-five centers in all.

The hardware? Two Sun servers running database software with data downloaded from an IBM® 3090 mainframe.

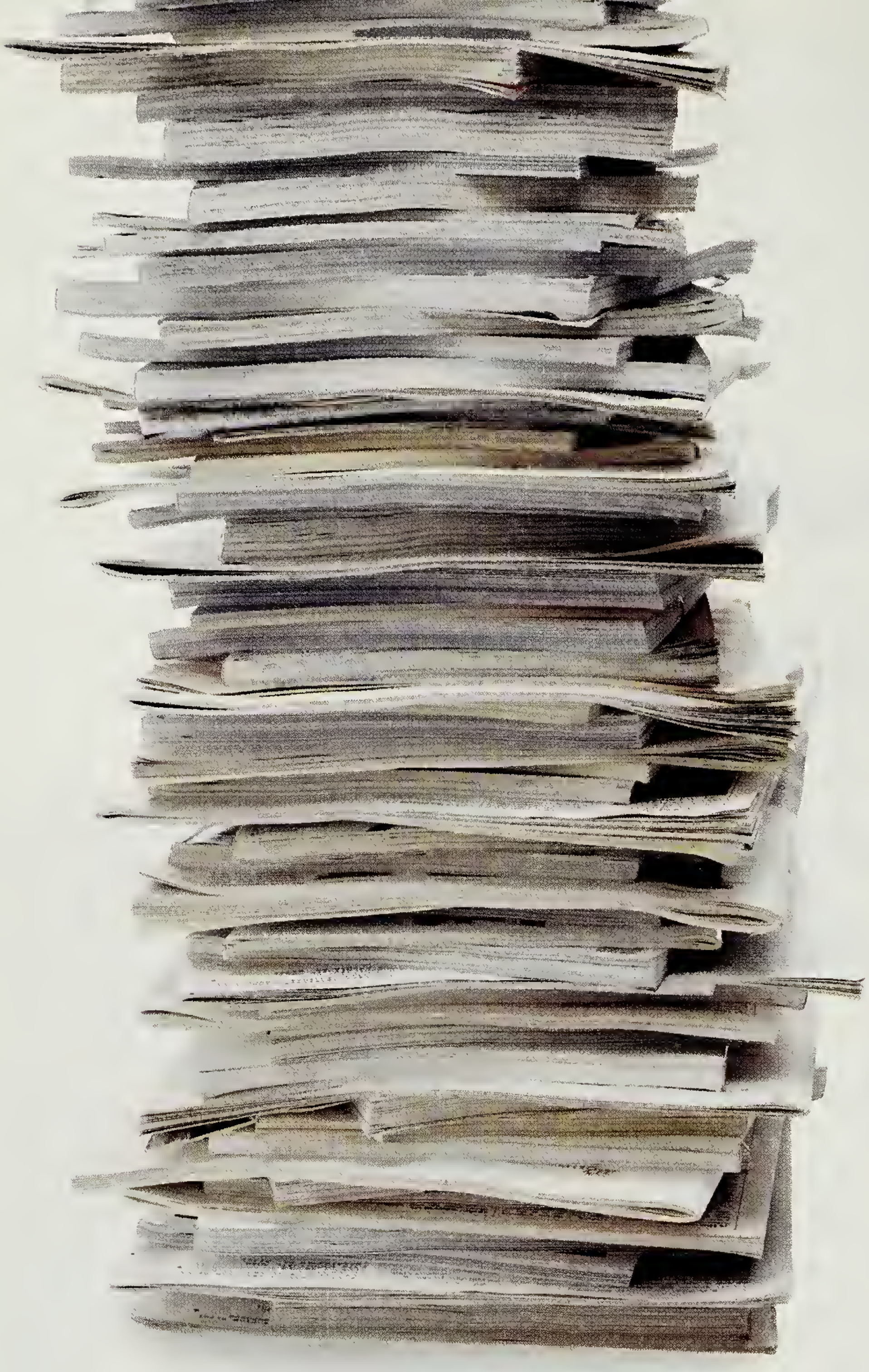
Gained: Improved decision making, faster response time, reduced maintenance and support costs, and a system that gives more flexibility to the end user.

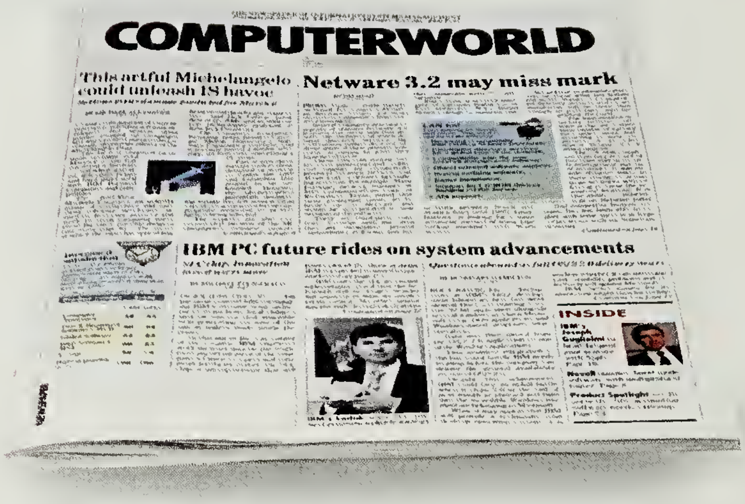
It's no wonder that more and more companies are seeing that client-server computing can cut costs, increase competitiveness and position their computing department for the future.

To see how others are doing it, and to find out if it's a direction that's right for you, call 1-800-426-5321, ext. 500.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business





COMPUTERWORLD

This artful Michelangelo could unleash IS havoc

Netware 3.2 may miss mark

IBM PC future rides on system advancements

INSIDE

IT'S NOT HOW MUCH YOU READ.

IT'S WHAT YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld.*

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PCs, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

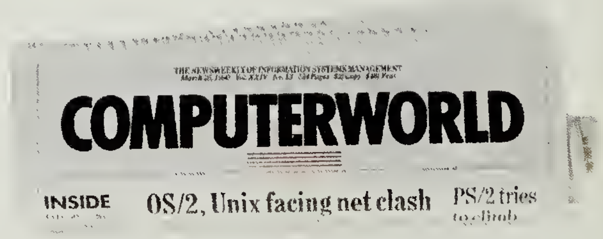
It's everything you need to know to get an edge on the competition.

That's why over 135,000 IS professionals pay to subscribe to *Computerworld* every week.

Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, The *Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at 1-800-343-6474. Please refer to code DP1J2-7 when ordering. Or use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld.*

Then you can spend less time reading about the world of information systems. And more time conquering it.



THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT

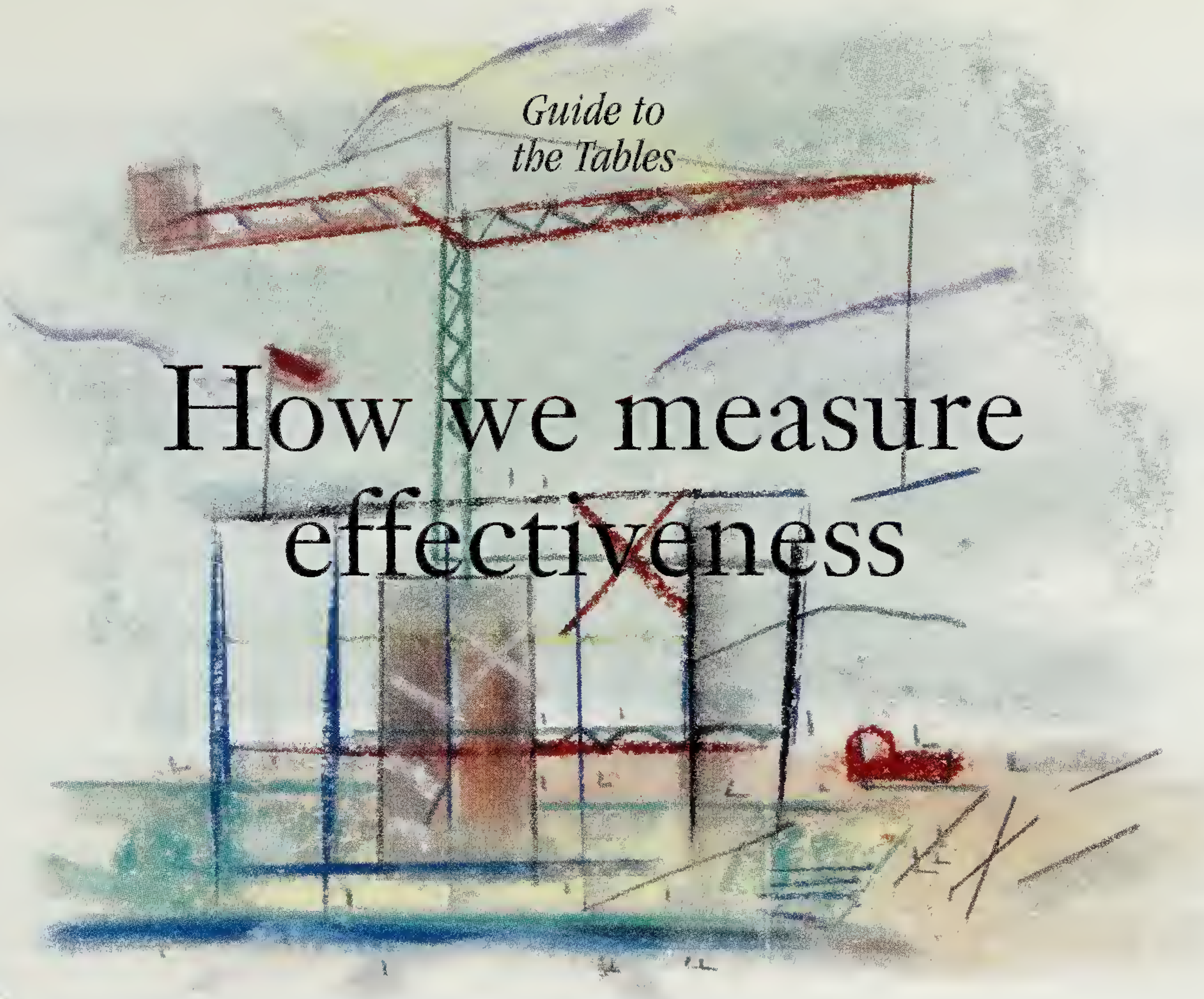
COMPUTERWORLD

INSIDE OS/2, Unix facing net clash PS/2 tries

The Newspaper of IS

Guide to the Tables

How we measure effectiveness



There is no single measure that defines the effective use of information systems by a large company. But it is possible to assess effectiveness based on a broad dimension of measures that balance both the qualitative and quantitative aspects of technology use. *Computerworld*'s *Premier 100* provides this analysis.

Each year since 1988, we have taken the top half of the Fortune 500 industrial and service companies and looked at how they invest in and deploy IS. By combining seven measures, we assess which companies lead their industries in the effective use of IS.

These measures include: 1) assessment of the company's effectiveness, according to its peers; 2) IS budget for that year; 3) company profitability over five years; 4) current market value of major hardware; 5) IS staff expenditures; 6) IS training investments; and 7) the number of personal computers and terminals installed in the company.

A total of 600 companies were included in this year's study. More than 40 specific industry breakdowns were used to calculate the ranking.

Aside from sales and profit information, the data was provided by IS executives at the highest level of each of the companies. In cases where companies did not supply data, *Computerworld* generated estimates by working with consulting and industry sources.

The total points used to rank the companies are the sum of all the points collected in all seven measures. The peer assessment has the highest value (a multiplier of 30). The other measures have an equal value (a multiplier of 15), except for staff (which has a multiplier of 10). Each measure is calculated and ranked separately for all the companies.

Among the best judges of IS effectiveness are the IS executives themselves. For this reason, we have a measure based on how IS executives rank their peers from a list of companies in their industry group. They are asked to select the Top 5 most effective users of information systems in their industry and rank them one to five. The total peer score is based on the combination of all the rankings a company achieves.

How committed is a company to IS? We use an industry comparison of a company's IS budget as a percentage of revenue to answer this question.

This measure takes into account the combined domestic IS spending of the corporation, including subsidiaries. The budget as a percentage of revenue is compared with an average for that company's industry. Above-average budget ratios receive higher points than do below-average ones.

IS staff and training spending are measured as a percentage of the combined corporation budget. Higher training investments receive more points than lower ones to account for the importance of a well-educated IS staff. Lower staff investments receive more points than higher ones to reflect the efficiencies gained from automation.

To reflect the IS contribution to business performance, profit growth is measured after taxes and extraordinary credits over a five-year period. Profits for mutual insurance companies are based on net income. This year's ranking is based on the average percentage for 1987 through 1991.

How current is a company's technology investment? The dollar value of mainframes, minicomputers and supercomputers on today's market is measured as a percentage of revenue to assess this aspect.

One of the IS organization's prime missions is to provide access to technology to employees throughout the corporation. We measure the total number of PCs and terminals as a percentage of total employees to gain a snapshot of how IS answers this mission. The companies with the most PCs and terminals per capita receive the most points. ■

ILLUSTRATION BY JEFF JACKSON

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

AEROSPACE

1992 Industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
1	The Boeing Co.	65,610	37.7%	$1,600	5.46%	$562.5
2	Grumman Corp.	64,555	30.3%	$153	3.78%	$75
3	McDonnell Douglas Corp.	62,695	13.0%	$683	3.65%	$256
4	Martin Marietta Corp.	62,680	9.3%	$301	4.93%	$94.6
5	Lockheed Corp.	61,595	10.1%	$320	3.26%	$324
6	Raytheon Co.	59,320	7.4%	$105	1.12%	$60
7	Rockwell International Corp.	59,100	(0.5)%	$285	2.37%	$145
8	Textron, Inc.	57,675	4.2%	$169	2.16%	$70
9	Northrop Corp.	57,150	(48.6)%	$248	4.35%	$1.4
10	General Dynamics Corp.*	53,340	(59)%	$350	3.67%	$200
	Industry average	60,372	.4%	$421	3.5%	$179

CONSUMER PRODUCTS AND SERVICES

1992 Industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
1	Reader's Digest Association, Inc.	64,220	22.8%	$120	5.01%	$19
2	Procter & Gamble Co.	62,255	37.7%	$236.6	.86%	$48
3	Levi Strauss Associates, Inc.*	61,200	17.0%	$125	2.5%	$15
4	Gillette Co.*	59,780	17.0%	$120	2.5%	$89
5	American Brands, Inc.	59,705	12.3%	$73.5	.88%	$17
6	The Dun & Bradstreet Corp.*	59,650	7.8%	$778	16.6%	$150
7	McGraw-Hill, Inc.*	59,345	6.1%	$166	8.54%	$100
8	Helene Curtis Industries, Inc.	59,000	(13)%	$30	3.36%	$12
9	Humana, Inc.	58,825	16.6%	$90	1.53%	$100
10	Johnson Controls, Inc.	58,675	2.0%	$60	1.31%	$7
	Industry average	60,266	12.6%	$180	4.3%	$56

FINANCIAL SERVICES

1992 Industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
1	J. P. Morgan & Co.	64,435	30.8%	$510	4.94%	$65
2	Primerica Corp.	63,890	59.0%	$293.1	4.43%	$58
3	Banc One Corp.	63,650	27.8%	$293	7.1%	$79
4	CoreStates Financial Corp.	63,475	23.0%	$103	4.32%	$24
5	KeyCorp	63,355	24.8%	$48.7	2.16%	$17.3

Listings continue on the following page

---

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
1.92%	53%	2%	122,600	77%	Bucks trend: 23% budget increase
1.86%	48%	3%	18,250	77%	Networking emphasis brings efficiency
1.37%	45.9%	2.5%	75,400	69%	Cut five data centers; added 5,400 PCs
1.55%	21%	1%	23,700	39%	Server strategy increases productivity
3.3%	41%	1%	45,000	62%	Up to 30% savings from recentralization
.64%	40%	1%	34,000	47%	Emphasis on imaging, paperless design
1.21%	52%	4%	59,000	68%	NASA contractor ups IS budget 10%
.89%	41%	6%	25,500	49%	Nets 6% profit rise; IS focus: TQM
.02%	49.6%	2%	23,900	66%	IS consolidations save $25 million
2.09%	53%	1%	7,600	9%	$3 billion CSC outsourcing contract
1.4%	44%	2%	43,500	56%	
.79%	45%	3%	4,589	62%	Global drive; $22 million budget rise
.18%	38.3%	2.2%	48,000	46%	Close customer links; brand focus
.31%	44%	3%	4,000	12%	IS links Levi value chain with EDI
1.89%	50%	5%	9,000	29%	Global strategy requires flexible IS
.2%	45%	2%	10,000	20%	Balances business unit; central IS
3.5%	45%	3%	50,000	86%	Emphasizing lower cost IS services
5.1%	42%	3%	5,000	37%	Client/server rollouts; 15 business units
1.35%	39.7%	3.1%	3,600	100%	Customer drive fuels 10% budget rise
1.69%	45%	1%	18,000	26%	1992 initiatives: Imaging, LANs
.15%	42%	2%	11,000	26%	Even budget; IS focus: Customer service
1.5%	44%	2.7%	16,319	46%	
.63%	36%	1%	12,500	95%	Profits up 44%; IS focus: Desktop Unix
.88%	31%	4%	18,100	72%	Income up 28%; highly decentralized IS
1.9%	30.7%	4%	29,500	100%	IS effort aides most profitable year ever
1.01%	38%	1.6%	10,500	78%	Even spending; 30% business growth
.77%	38%	.5%	13,894	100%	IS keys acquisitions; budget up $8 million

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 Industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
FINANCIAL SERVICES						
6	BankAmerica Corp.*	63,205	1.9%	$700	5.71%	$93.7
7	Barnett Banks, Inc.	63,125	13.3%	$142	4.34%	$30
8	Unum Life Insurance Co.	61,685	21.9%	$92.5	3.82%	$9
9	Bankers Trust New York Corp.	61,580	(25)%	$435	6.36%	$70
10	Massachusetts Mutual Life Insurance Co.	61,420	20.3%	$70	1.04%	$9
	Industry average	62,982	19.8%	$269	4.4%	$45.5
INDUSTRIAL AND AUTOMOTIVE PRODUCTS						
1	Dresser Industries, Inc.	61,115	28.4%	$116	2.47%	$30
2	Black & Decker Corp.	60,390	22.7%	$80	1.73%	$40
3	Caterpillar, Inc.	59,235	(39.4)%	$346.1	3.4%	$191.5
4	Harley-Davidson, Inc.	58,910	21.3%	$7	.74%	$6
5	Eaton Corp.	58,595	(17.2)%	$76	2.1%	$30
6	Ford Motor Co.*	58,205	(44)%	$1,330	1.5%	$400
7	Deere & Co.	58,005	7.25%	$202.3	2.87%	$125
8	Paccar, Inc.*	57,890	1.75%	$40	1.7%	$28
9	Trinity Industries, Inc.*	57,365	51.1%	$15	1.2%	$6
10	Ingersoll-Rand Co.*	56,945	9.1%	$60	1.67%	$16
	Industry average	58,665	4.1%	$227	1.9%	$87.3
MANUFACTURING						
1	Kimberly-Clark Corp.	62,410	19.1%	$116	1.7%	$32
2	Corning, Inc.	61,910	12.4%	$80	2.43%	$30
3	3M Co.	61,275	6.8%	$310	2.32%	$251
4	Inland Steel Industries, Inc.	60,845	(32.8)%	$60	1.76%	$8.6
5	Cone Mills Corp.*	60,130	12.0%	$10	1.43%	$7
6	Amoskeag Co.*	59,675	49.0%	$18	1.45%	$10
7	Eastman Kodak Co.*	59,430	(27.0)%	$518	2.64%	$50
8	Sonoco Products Co.	59,255	14.2%	$9	.53%	$.5
9	Polaroid Corp.	58,955	(24)%	$67	3.2%	$39
10	Bethlehem Steel Corp.	58,945	(34.0)%	$82.6	1.91%	$5.4
	Industry average	60,283	(0.4)%	$127	1.9%	$43.4

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.76%	29%	1.4%	81,000	100%	Swallows $400 million Security Pacific IS
.92%	35%	4%	14,000	79%	$50 million invested in PC/LAN project
.37%	46%	2.5%	5,900	100%	15% IS budget hike backs client/server
1.02%	29%	2.5%	13,000	100%	Strong profits; architecture rewrite
.13%	59%	2%	7,438	76%	OLTP system nets 40% productivity rise
.84%	37%	2.4%	20,583	90%	
.64%	46%	3%	4,000	13%	Uses EDI to shorten order process
.86%	35%	5%	10,000	26%	Focus: Quick response and MRP II systems
1.88%	53.7%	1.4%	30,000	56%	Systems rebuilt for speed/Integration
.64%	35%	25%	600	11%	High demand met by new inventory systems
.82%	39%	2%	13,000	36%	Cost containment on a global scale
.45%	52%	5%	70,000	21%	Rebound under way; plant floor systems key
1.77%	42%	1%	18,500	51%	Streamlining yields low-cost production
1.2%	42%	2%	4,000	39%	Diversifying IS throughout truck business
.48%	40%	2%	3,500	36%	Lowest cost rail car producer
.45%	54%	7%	10,000	32%	Migrating from mainframe to AS/400s
.9%	44%	5%	16,360	32%	
.47%	36%	3%	16,400	40%	Major IS initiatives across the board
.91%	50%	4%	9,000	29%	Internal operations revamp with TQM
1.88%	55%	8%	47,000	53%	Replaced midrange with PCs/servers
.25%	47%	.8%	6,306	34%	Open systems, paper reduction emphasis
1%	42%	2%	6,000	43%	Internal systems shift to real time
.8%	45%	5%	3,000	17%	Fieldcrest Cannon plant modernization
.25%	40%	2.5%	75,000	56%	IBM outsourcing, integration reduce costs
.03%	42%	4%	1,200	9%	Shift to global supplier yields new systems
1.86%	58%	3.5%	6,000	50%	IS integrates applications
.13%	67%	1.3%	7,603	28%	Data mining, networks speed business
.76%	48%	3.4%	17,751	36%	

THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 Industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
PETROLEUM AND CHEMICALS						
1	**Phillips Petroleum Co.**	62,965	16.8%	$183	1.45%	$21.7
2	**The Dow Chemical Co.**	61,590	5.3%	$400	2.07%	$122.7
3	**FMC Corp.**	61,350	(0.8)%	$118	3%	$40
4	**Unocal Corp.**	61,255	6.5%	$178	1.82%	$46
5	**Union Texas Petroleum Holdings, Inc.***	60,360	55.2%	$6	.56%	$5
6	**Monsanto Co.**	60,115	(3.8)%	$185	2.07%	$140
7	**Ashland Oil, Inc.**	59,580	21.5%	$76	.82%	$4.5
8	**Rohm and Haas Co.**	59,080	(2.3)%	$98	3.53%	$21
9	**NERCO, Inc.**	59,040	8.75%	$10.3	1.12%	$4.8
10	**Air Products and Chemicals, Inc.***	58,755	15.1%	$51	1.73%	$10
	Industry average	60,409	12.29%	$130.5	1.8%	$41.6
PHARMACEUTICALS AND FOOD						
1	**Merck & Co.**	63,135	23.8%	$160	1.86%	$120
2	**Schering-Plough Corp.**	61,820	19.5%	$67	1.82%	$20
3	**Becton, Dickinson & Co.**	61,685	6.4%	$57.7	2.66%	$25
4	**Sara Lee Corp.**	61,535	19.7%	$137.7	1.11%	$24.6
5	**International Multifoods Corp.**	61,275	(4.8)%	$11	.5%	$4
6	**Pepsico, Inc.**	60,920	16.5%	$350	1.77%	$50
7	**Bristol-Myers Squibb Co.***	59,375	31.2%	$209	1.85%	$80
8	**Upjohn Co.***	59,270	17.1%	$57	1.63%	$30
9	**Abbott Laboratories***	59,175	14.6%	$170	2.46%	$28
10	**Johnson & Johnson***	59,030	15.4%	$231	1.86%	$70
	Industry average	60,722	15.9%	$145	1.75%	$45.2
RETAILING AND WHOLESALING						
1	**Wal-Mart Stores, Inc.***	62,640	17.5%	$335	.76%	$96
2	**Sears, Roebuck and Co.**	62,435	5.7%	$1,233	2.15%	$687
3	**The Home Depot, Inc.**	62,110	46.6%	$42	.82%	$15
4	**FoxMeyer Corp.**	60,425	7.8%	$44	1.46%	$4
5	**Dillard Department Stores, Inc.***	60,325	22.8%	$29	.69%	$5.8

Listings continue on the following page

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.17%	43.5%	.93%	14,265	63%	Major shift: Mainframe to workstations
.64%	37%	10%	32,000	51%	Rebuilt integrated financial/order systems
1.02%	37%	7%	11,400	49%	Profit up 6%; WAN/workstation projects
.47%	34%	2.3%	9,860	57%	Multimedia training; major downsizing
.47%	37%	1%	300	29%	Half the size; twice the profit
1.57%	38%	4%	15,000	38%	10% budget hike; global decision support
.05%	32%	3%	8,300	25%	Single shared data center; divisional PCs
.76%	36%	1.2%	6,600	51%	$10 million project: On-time product delivery
.52%	29%	1%	650	38%	Profits up 4%, downsize to open systems
.34%	43%	3.7%	6,500	45%	8% profit rise; decentralizing IS duties
.60%	36.7%	3.4%	10,488	45%	
1.39%	50%	6%	15,000	40%	Profit up 19%; new CIO, supercomputer
.54%	31%	2.5%	5,000	25%	14% more profits; 10% more IS spending
1.15%	46.3%	5.9%	8,719	47%	16% budget hike; network rollout
.2%	45%	4.5%	30,000	27%	Mission-critical PCs replace mainframe
.18%	36%	1%	1,500	16%	39% profit jump; solid IS investments
.25%	35%	3%	32,000	9%	Empowering through IS; most revenue
.71%	48%	2%	24,000	45%	Profits up 18%; focus on IS efficiency
.86%	50%	4%	6,500	34%	IS aim: Internal marketing; 18% profit rise
.4%	52%	1%	15,000	33%	13% more income; automated purchasing
.56%	46%	5%	15,000	18%	Profits up 28%; IS planning global video
.62%	44%	3.5%	15,272	29%	
.22%	41%	1%	77,360	21%	24% profit rise; low-cost EDI leader
1.2%	40%	3%	350,000	78%	Profits up 42%; budget up 5%
.29%	44%	1%	3,000	10%	Growth boosts mainframe capacity 50%
.13%	50%	1%	3,000	29%	IBM outsourcing; warehouse robotics
.14%	43%	3%	4,000	12.4%	10% profit rise; focus on quick response

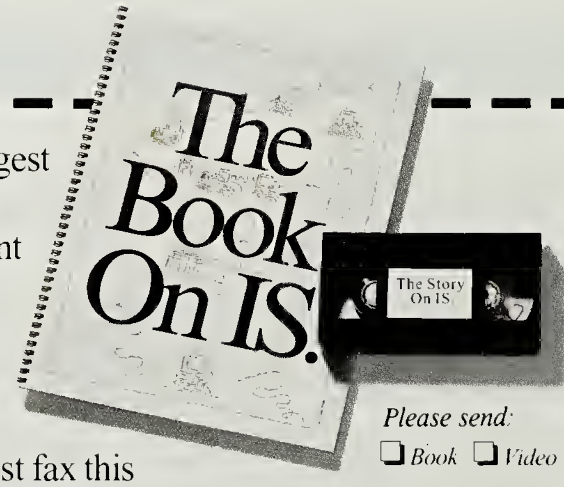
THE 100 MOST EFFECTIVE USERS OF INFORMATION SYSTEMS

1992 Industry rank	Company	Total score	Profit growth 1987-1991	IS budget (millions)	IS budget as % of revenue	Processor market value (millions)
RETAILING AND WHOLESALING						
6	Kmart Corp.	60,290	17.5%	$215.2	.62%	$57
7	Bergen Brunswig Corp.	59,335	38.6%	$20	.4%	$16
8	Winn-Dixie Stores, Inc.*	59,085	11.2%	$98	.97%	$50
9	Toys R Us, Inc.*	58,715	14.2%	$49	.80%	$12
10	Nordstrom, Inc.	58,705	10.9%	$25.2	.79%	$3.8
	Industry average	60,407	19.3%	$209	.95%	$94.7
TRANSPORTATION						
1	AMR Corp.	66,895	23.9%	$1,090.8	8.4%	$79
2	Airborne Freight Corp.	64,425	45.9%	$55	4.02%	$6
3	Roadway Services, Inc.	63,405	27.4%	$93.9	2.96%	$53.4
4	Northwest Airlines	61,645	32.8%	$205	2.7%	$47
5	J. B. Hunt Transport Services, Inc.*	61,170	2.7%	$15	2%	$8
6	International Shipholding Corp.*	60,415	(.2)%	$12	3.65%	$3
7	Federal Express Corp.	60,130	(28)%	$360	4.7%	$150
8	Hawaiian Airlines*	59,855	(70)%	$12	3.28%	$6
9	Carolina Freight Corp.	59,810	(1.5)%	$13.7	1.78%	$20
10	Southwest Airlines*	59,450	11.6%	$4.7	.36%	$3
	Industry average	62,020	4.5%	$186.2	3.4%	$37
UTILITIES						
1	MCI Communications Corp.	64,460	49.8%	$460	5.45%	$330
2	Bell Atlantic Corp.	63,975	2.9%	$750	6.11%	$553
3	Carolina Power & Light Co.	63,855	12.2%	$75	2.76%	$25
4	Southern Co.	62,345	17.3%	$200	2.48%	$16
5	Northeast Utilities	62,075	1.3%	$72.8	2.64%	$97
6	Ameritech Corp.	61,290	(0.4)%	$560.5	5.18%	$129
7	Duke Power	61,190	4.4%	$76.6	2.01%	$13
8	Baltimore Gas & Electric	59,730	(5.3)%	$62.9	2.56%	$75
9	GTE Corp.*	59,500	9.1%	$800	3.6%	$140
10	AT&T	59,480	(69.9)%	$2,900	4.5%	$900
	Industry average	61,790	2.1%	$595.8	3.8%	$227.8

*Estimates are from *Computerworld* sources and not the companies

Market value as % of revenue	% of IS budget for staff	% of IS budget for training	Total PCs and terminals	% of employees with PCs/terminals	Company highlights
.16%	39.6%	.72%	108,348	31%	Profits up 14%; radio-frequency terminals
.33%	52%	5%	2,700	73%	5% budget hike; development decentralized
.49%	37%	5%	30,000	28%	1,200 new in-store minicomputers added
.20%	45%	5%	4,000	10%	4% profit rise; Ethernet satellite system
.12%	45%	2.96%	910	3%	17% more net income; supplier E-mail
.33%	44%	2.2%	58,332	29%	
.61%	27.6%	.3%	117,889	100%	100% ROI required for new IS projects
.44%	35%	.8%	8,700	6%	Even spending, more EDI services
1.68%	37%	1.7%	15,650	43%	17% budget rise; desktop/handheld PCs
.62%	32%	1%	3,000	79%	Focus: Unix applications; in-flight network
1%	42%	4%	2,000	21%	Rewriting 80% of its application code
.91%	41%	2%	600	77%	Goals: Improve efficiency, control expense
2%	48%	3%	60,000	73%	Even budget; innovative flight tracking
1.64%	42%	2%	1,000	37%	Focus: Cost reduction; efficiency
2.6%	34%	2%	1,400	13%	EDI customer applications save staff costs
.23%	44%	3%	1,100	10%	Budget up 15%; flight operations system
.97%	38%	2%	21,134	36%	
3.91%	46%	6%	34,000	100%	Nearly twice the earnings; 4.5% budget hike
4.5%	37%	5.1%	70,000	92%	Budget part of $2 billion, 10-year IS revamp
.92%	37%	4%	6,500	78%	25% productivity boost from TQM system
.2%	40%	1%	18,000	59%	Flat budget; extensive fiber-optic backbone
3.52%	46.5%	4.8%	6,253	77%	Profits up 12%; $35 million tracking system
1.19%	62%	1.5%	66,000	89%	Four new data centers worth $150 million
.34%	44%	3.5%	13,000	67%	Cost savings through internal IS investment
3.05%	59.2%	1.3%	5,000	52%	$2.5 million WAN; $7 million project
.64%	37%	5%	60,000	37%	Three-year $150 million client/server plan
1.4%	45%	6%	315,000	99%	65% savings projected NCR-based migration
1.97%	45.4%	3.8%	59,375	75%	

We left out everything in this ad except what was important to you.



Information Systems is the largest computer market in the world. Computerworld readers account for *$81 billion* of it.

And we thought that might be important to you.

To learn more, ask for our book and video all about IS. Just fax this coupon to 1-508-879-0446, or mail it to the address below.

Please send:
☐ *Book* ☐ *Video*

Name *Company*

Address

City *State* *Zip*

Phone

©1992 Computerworld, Dept. P1 375 Cochituate Rd.,
Framingham, MA 01701-9171. An IDG Company.

COMPUTERWORLD
The Newspaper of Information Systems.

(Clip-out and fax or mail)

The
Last Word

Do you have what it takes?

▶ BY DUWAYNE PETERSON

I haven't met all the IS executives honored in *Computerworld*'s *Premier 100*, but I do know several things about them. I know that they work hard and that they aren't inclined to rest on their laurels.

It couldn't be otherwise: Using information systems effectively is a job that never ends. The first condition for effectiveness is credibility. Before an IS organization can even hope to make a real difference, it must earn the trust of everyone from top executives to business unit staffers.

Another condition for effectiveness, which is very close to credibility, is relevance to the business. This cannot be taken for granted. Business priorities are changing rapidly, and an IS organization that hopes to stay relevant has to be able to keep up a stiff pace, adapt easily and rise to fresh challenges as quickly as they appear.

That's not all it takes to be an effective user of information systems. Here are some of the other major requirements:

- Close coordination between strategic business planning and IS planning.
- Effective IS management processes and performance measurement.
- A well-conceived and well-constructed infrastructure.
- Process change that is more than automation.
- Effective human resource management.

Integration of strategic business planning and IS planning has been talked about for so long that many people take it for granted. But the reality is that it still does not happen in most organizations. Without this integration, there is no way for IS to be effective because it is a rudderless ship groping for direction.

For its part, the IS organization must have the management capability to operate within the planning process and provide value to the total business plan. IS must have a solid vision of its own role in achieving the plan's objectives.

Getting from wherever you are to wherever you need to be always demands some kind of infrastructure. In the case of IS, you need systems architecture, data management, system tools and standards. Your architecture must include not only how computing is accomplished — on a mainframe, in client/sever mode and so on — but how information is integrated across the organization and how the IS function is structured to support computing activities.

The major task is to figure out how to structure IS resources to best accommodate two ongoing requirements: low-cost, highly responsive services across the organization and individualized services that can be identified and directed by business units. There is no formula for how much of any organization's IS resources should be integrated or dedicated; the key is to address the issue and not be trapped by too narrow an approach such as one that is either all centralized or all decentralized.

Another major part of systems architecture is the network strategy. Organizations are providing increased interoperability among internal organizations, customers and suppliers. The IS groups that have established the proper infrastructure and are focusing on the network will be positioned to exploit these new capabilities.

A flexible and responsive infrastructure sets the stage for effective process change, which is where the real benefits are delivered. The concept of business process re-engineering may be an overworked term, but it is a major part of delivering maximum benefit. We simply can't afford to continue automating inefficient business processes.

The best way to achieve process improvement is through a strong partnership with the business organization. It is critical that key processes are examined, challenged, revised or eliminated.

The final, and possibly most important, issue is human resource management. Without a skilled, well-trained work force, none of these things is possible. ■

Peterson, former CIO of Merrill Lynch & Co., heads DuWayne Peterson Associates, an IS consultancy.

PHOTOGRAPHY BY ALAN LEVENSON

16,000 experts
500,000 clients
125 countries

A Fortune 500 company?

©1992 Sun Microsystems, Inc. Sun, Sun Microsystems, and the Sun logo are trademarks or registered trademarks of Sun Microsystems, Inc. All other products or service names mentioned herein are trademarks or registered trademarks of their respective owners.

Actually, it's Sun's Customer Support.

These days, the most impressive performance isn't just inside your Sun™ computer. It's behind your Sun computer, too, with Sun Customer Support.

Sixteen thousand experts in 125 countries support more than 500,000 UNIX® systems, making Sun the world's largest installer and supporter of UNIX-based client-server systems.

As a Sun customer you'll draw from 65 training centers and 24 answer centers for hardware, software, and network support. Easy to use support tools, such as AnswerBook, SunSolve and HelpDesk are available. And because Sun products have upgrade paths built right in, our experts can help you plan for the future right from the start.

How well have we met your needs?

Recently Sun was awarded a 94 percent loyalty rating from among Sun customers — significantly higher than the industry average. And Sun Customer Support has helped to make the cost of owning Sun among the lowest in the industry.

But as for how satisfied we are? Well, we're still working on that 6 percent.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

When you see the words “heroes of the computer revolution” who do you think of?

Think again.

The biggest heroes in computing these days are people like you, who have found smart, innovative ways to use computers.

And what do you have to show for your boldness? You have made your companies more competitive by finding innovative ways to use information.

By listening to people like you, we at Sun™ will learn to deliver better and better ideas.

After all, our industry is still young. Who knows how far you can take it.

Sun

Sun Microsystems Computer Corporation
A Sun Microsystems, Inc. Business

©1992 Sun Microsystems, Inc. Sun is a trademark of Sun Microsystems, Inc.